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ABSTRACT

Many schools and states have moved in recent years to more "authentic" ways of assessing student learning. However, most assessments are essentially summative, one-shot measurement of outcomes. This book is based on the work of Designing Schools for Enhanced Learning, a group of schools and educators that have worked with the Regional Laboratory for Educational Improvement of the Northeast and Islands to better integrate teaching, learning, and assessing. Its guidelines were developed within the context of the National Education Goals, with an emphasis on the community. This guidebook outlines a process for redesigning schools in which learning, teaching, and assessing are strongly interconnected. Its framework is based on the premise that knowledge about learners and learning drives good teaching and assessment. Chapter 1 depicts a process that can result in a learning-driven education for all students. It discusses the definition of community as it relates to schools and the role of a multiconstituent design team. Chapter 2 illustrates principles of learning and development and describes current work to redefine learning outcomes that are important to all students. The third chapter presents current thinking about assessments and issues to consider as assessment plays a broader role in learning. The fourth chapter describes principles for designing new learning environments, taking into account the issues that challenge all school-community members. Appendices provide information on group activities, evaluation techniques, and innovative assessment plans. Fifteen figures are included. (Contains 154 references.) (LMI)

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Genuine Reward: Community Inquiry into Connecting Learning, Teaching, and Assessing

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Foreword

The most successful education reform efforts focus on what really counts: what students should learn, what they should know, and what and how they should be able to demonstrate their knowledge and skills. Such reforms pay attention to three essential domains – learning, teaching, and assessing – as well as how the three can best support each other. Among the challenges facing education reformers is that of developing or finding assessments that measure real knowledge and skills. Ideally the assessing process will itself further the learning process and inform the teaching process. Most would agree that the standard "standardized" test – or most multiple choice, short-answer tests for that matter – do not measure what we want to be measuring, nor do they foster learning.

Thus, many schools and states have moved in recent years to more "authentic" ways of assessing student learning; these assessments, in turn, are based on more authentic curricula. Even so, most assessments are still tied to a concept of reward and punishment. Such assessments are essentially summative in nature; they are one-shot measurements of outcomes from which students learn little or nothing in the process or from the results.

This disconnection between assessment and learning is a tremendous source of frustration for educators who value assessment as an integral part of the teaching and learning process. Some of these educators chose a few years ago to join this Laboratory in a developmental effort called Designing Schools for Enhanced Learning. Since 1991, these individuals and their school communities have been working together and with the Laboratory to better integrate learning, teaching, and assessing in their schools and classrooms. Working within the context of National Education Goals and a movement toward national standards, they have involved their communities in defining what their students should know, be able to do, and demonstrate. In general, the schools believe that to succeed, students must gain:

- skills for learning and communicating, including reading, writing, computing, listening, speaking, technological and scientific literacy, critical thinking, and problem solving;
- essential knowledge that will help them understand and operate in a multiracial, multicultural, interdependent world; and
- a sense of efficacy and personal and social responsibility.

Genuine Reward: Community Inquiry into Connecting Learning, Teaching, and Assessing is one result of our work together.

Our emphasis on community is deliberate. When individual students achieve success in school, the whole community reaps the benefit of fulfilling the social contract that underlies this country's democracy. Even the current national education reform movement, especially as formalized in the *Goals 2000: Educate America Act* enacted by Congress in the spring of 1994, recognizes the essential role of local communities and states. A driving force in this movement is the desire to improve what students know and can do and to measure and hold both students and the educational system accountable for whether or not they succeed according to several assessment measures.

Several states in the Northeast have been in the forefront of a movement to focus on all students and their learning. Initiatives in Connecticut, Maine, Massachusetts, and Vermont, for example, have developed a common core of knowledge that all students should know and demonstrate by the time they graduate from high school. These frameworks are being developed with input from many different constituencies. They are now used to generate community standards as well as to connect content and knowledge standards being developed by content-specific experts.

Ultimately, the phrase "think globally, act locally" applies fully to how education and the systems that promote and deliver it get shaped. Educational improvement happens classroom by classroom, school by school, and community by community. All educational reform efforts – whether at the national level where content experts define what is most important to learn in each subject, or at the state level where much of the activity for improvement is centered – have to eventually be taken, understood, and formulated to fit the needs, culture, expectations, and idiosyncracies of a local community school. This guide offers some processes for communities to use to engage with the most fundamental aspects of education and to shape a response to the reform movement that will best serve all the children of their community.

As acknowledged elsewhere, the guide has been codeveloped with schools that are part of the Laboratory's Designing Schools for Enhanced Learning initiative, a multifaceted, systemic change effort focused on developing understanding of how to improve systems and schools so that *all* children can learn. In addition to redesigning their own systems to enhance learning for all students, the schools that are part of this partnership reach out to other schools and communities in their own area as well as across state boundaries. They also share their learnings by contributing to publications like this one.

This book, then, is one result of their learnings and is thus grounded in real experience with reform over several years. It is also a compilation of the relevant research that lays out as its conceptual framework that learning, teaching, and assessing are overlapping and interconnected. Each of its activities has more than one purpose, and everyone involved – community members, teachers, and students – plays more than one role.

We share this knowledge and experience with you in the hope that it will help your own community find the connection that will enable all your students to succeed in school.

Glen Harvey
Acting Executive Director
The Regional Laboratory for Educational Improvement
of the Northeast and Islands

November 1994

Acknowledgments

This guide is the result of the contributions of many. We have worked closely with teachers and administrators, other Laboratory staff, our colleagues in colleges and universities, and others who are known for their expertise and commitment to making our schools better places for all students. We would like to acknowledge the special contributions to this book of the following people:

Susan Loucks-Horsley for her enthusiasm throughout the development of this work and her excellent editing skills, which are largely responsible for the ideas and writings of different people coming together as a readable text.

The members of the Assessment Working Party, as well as the hundreds of schools and other individuals who are also part of the Laboratory's Designing Schools for Enhanced Learning initiative. The members who contributed stories, vignettes, materials, and reviews are listed in the Notes section.

The many reviewers who took the time and care to talk with us about our ideas or provide constructive critique of drafts, including: Pamela Aschbacker, Richard Ayers, Jean Becker, Susan Ellis, Catherine Toomey Fosnot, Howard Gardner, Joan Herman, Carol Hodges, Michael Huberman, Beau Fly Jones, Carolyn Keeler, Cynthia Loker, Deborah Meier, Lynne Miller, Monty Neill, Barbara Presseisen, Ewa Pytowska, Senta Raizen, James Shea, Thomas Shuell, Harriet Siegel, Eliezer Vilinsky, Lucy Watkins, Grant Wiggins, and Veda Wright. Each reviewer was helpful to us in shaping and refining the final version.

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All those at the Laboratory who crafted this final product: Jan Phlegar, for making sure the book ultimately was completed; Sue Martin and Eileen Stevens for organizing the text and carefully editing the final product; and Clif Lund-Rollins, Priscille Shepard, and Stephanie Wallace for their excellent word processing skills, proficiency for book design, and calm temperaments.

And finally, our families who continued to encourage us over the long haul even when this interloper – the book – took our energies and attention.

Thank you. We could not have done it without you; this truly is the product of many people's labors.

Jill Mirman Owen
Pat L. Cox
John M. Watkins

Notes

Many of the personal stories, queries, vignettes, and materials incorporated into this book come out of the work of the Assessment Working Party of Designing Schools for Enhanced Learning, one of the program initiatives of The Regional Laboratory for Educational Improvement of the Northeast and Islands. The Assessment Working Party is a group of teachers and school administrators who, along with Laboratory staff, have been meeting formally since February 1992 to wrestle with tough issues around assessment and provide support to one another in moving assessment work forward. The vignettes and materials shared in the text are not meant to be examples of ideal practice. They are stories captured at a moment in time as the members of the Working Party struggle to change their thinking and practice and to contribute to a dialogue about creating learner- and learning-centered schools. The members of the Working Party who contributed to this book are from these schools:

Lake Garda Elementary School
Burlington, CT

Ezra H. Baker Elementary School
West Dennis, MA

Sumner Avenue Elementary School
Springfield, MA

Wolf Swamp Road School
Longmeadow, MA

Hillsboro-Deering Elementary School
Hillsboro, NH

Lafayette Regional School
Franconia, NH

Sunapee Central Elementary School
Sunapee, NH

Belle Sherman Elementary School
Ithaca, NY

VanCorlaer Elementary School
Schenectady, NY

Williamstown Elementary School
Williamstown, NY

Lawrence Barnes Elementary School
Burlington, VT

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Introduction

All across the nation, educators, parents, policy makers, and many others are working on different aspects of educational reform. Their efforts stem from the conviction that what our nation's education system has been able to do in the past – provide a good number of students with basic skills, graduate about half of them from high school, and send a number to college – is not enough for the future. A system that sorts young people rather than educating them equally, picking winners rather than developing them, as Hodgkinson (1988) phrased it, cannot prepare productive citizens for the twenty-first century.

Today, Americans are realizing that schools must fulfill their promise of universal, quality education. In the face of accelerating technological, economical, political, and social change, people are questioning not only the number of students who complete school, but the nature of the education they receive. Many who are currently involved in reform acknowledge that what is needed is a new definition of school and student success – a new vision of what young people need to know and be able to do that will allow them to be lifelong learners, problem solvers, communicators, and productive citizens in a constantly changing world. That new definition of successful learning, reformers contend, can then influence the design of other elements of the education system. Two elements that are particularly critical, since they bear so directly on learning, are teaching and assessment. How can young people learn what they need to know and how can their learning be monitored? Learning, teaching, and assessing – redesigned and connected – form the core of serious efforts for reform.

Whose role is it to develop this vision of a redesigned education system? An African proverb says it best: "It takes a whole village to raise a child." The entire community has the responsibility to nurture the next generation, to help them successfully meet the personal, professional, social, and ethical challenges of their time. Everyone, not just professional educators, needs to be engaged in rethinking and redesigning education in this country.

A Guide for Community Action

The purpose of this guide is to assist communities as they begin the challenging work of redesigning education. It addresses how a multi-constituent design team can engage members of the community to:

- determine what students need to know and be able to do, based on a common set of beliefs about learning and learners (*learning*);

- understand, support, and become involved in the various ways teachers work with students to help them learn (*teaching*); and

- help design new approaches to gather evidence regarding students' work as they develop these capabilities (*assessing*).

For communities to rethink and redesign their schools so that all students develop successfully, the entire community must have the opportunity to be involved in inquiry about learning, teaching, and assessing. By *inquiry* we mean an active process of participation and collaboration, of questioning and dialogue, among students, teachers, administrators, parents, and other concerned members of the community. The process is as much for the purpose of exploring new ideas, challenging existing beliefs, creating new images, and reflecting on progress and problems as it is for establishing consensus about outcomes, procedures, structures, and strategies. Therefore, the term *inquiry* is appropriate. The process is an ongoing one, because the world that young people are being prepared for is constantly changing, and so must the system responsible for educating them.

The process suggested in this guide engages a design team and then the larger community in exploring learning, teaching, and assessing and their connection. As a result, participants begin to design key elements of a learning environment in which all young people thrive. The book offers resources to draw on as communities create new images of such common terms as *school*, *teachers*, and *tests*. The resources include syntheses of current research and descriptions of the work of a wide variety of schools, reform efforts, and scholars whose thinking and actions can stimulate, validate, and provide additional substance for the work of redesign.

The emphasis of the guide is on learning and assessing, since teaching is treated effectively in so many other places. Further, some of what is often considered in the domain of teaching (what should students know and be able to do, as well as how can we design learning experiences based on what we know about how students learn) is being considered here as part of the critical domain of learning.

The purpose of this guide, then, is to serve initially as a spark and then as fuel for the fire of change in schools and communities. Our image is not that of a bonfire or a wild fire, but rather of a steadily burning flame that will continue to fuel the efforts of educators and members of their communities over time.

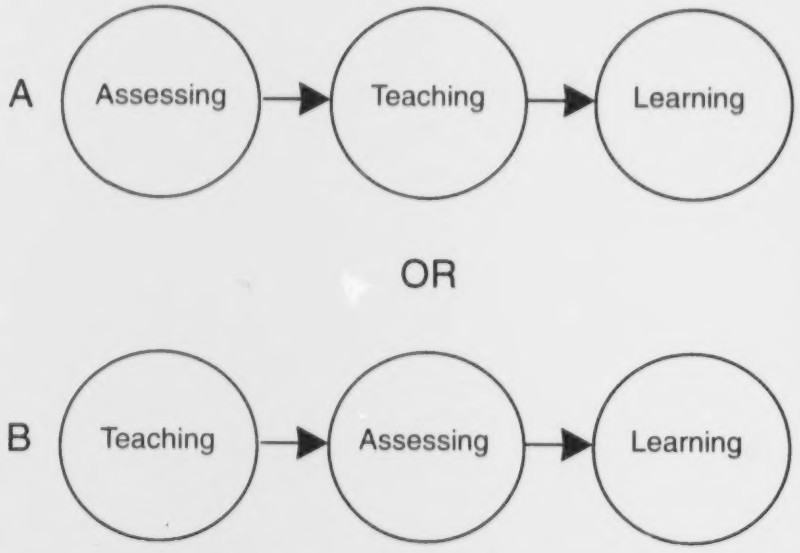
New Ways to Connect Learning, Teaching, and Assessing

Redesigning schools so that all students succeed requires looking at learning, teaching, and assessing in new ways. In this section, we describe a framework that incorporates new views of these domains and their connections to one another.

The Traditional Model

In many schools and classrooms today, learning is not the driving force. Rather, teaching and assessment drive decisions about learning. **Figure 1**, below, represents two ways that this happens. In the first case (A), people within schools focus first on what students will be tested on (for example, end-of-chapter questions or standardized tests). They then decide what to teach, which determines for the most part what students have the opportunity to learn. In the second case (B), people in schools plan curriculum; they decide what to teach and when. They then test whether the students have learned what has been taught.

Figure 1: A Traditional Model of Learning, Teaching, and Assessing



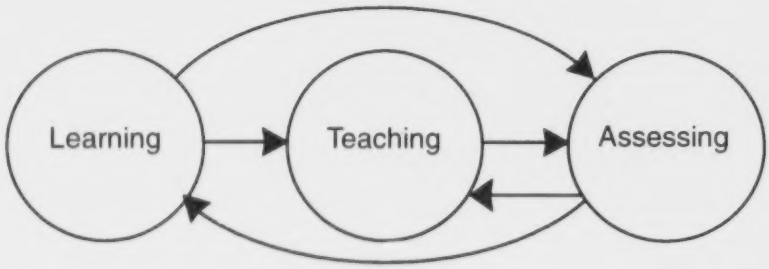
In both cases, there are no feedback loops connecting the learning outcomes to either assessing or teaching. The process is linear. Student learning does not drive either teaching practices or assessment. The disconnection is reflected in schools where curriculum coverage is paramount, where standardized tests drive what teachers teach or where testing consumes a great deal of time yet doesn't connect to what happens in the classroom.

A Learning-Driven Model

An alternative to these linear models is depicted in **Figure 2** on page iv. It occurs when learning is the driving force in schools where people pay attention to such questions as: What learning outcomes are most important? Who are our learners and what do they need? What is known about learning and development that should influence how we design

learning experiences? What do we know about how students are learning? What changes are needed in teachers?

Figure 2: A Learning-Driven Model



A parent tells how her town's school district office always sends home a notice before annual testing begins that asks parents to make sure their children have had a good night's sleep and a nutritious breakfast on testing days. Her question is, "Don't they care about learning days?"

Such schools specify results for learners and set standards for successful learning. These outcomes and standards then determine what is taught and how, as well as what is assessed and how. The information gathered through assessment tells students, teachers, parents, and other community members not only what and how students are learning, but how the efforts of adults support that learning. Students' understanding, not textbook coverage, determines next steps in teaching.

Organizing around learning requires flexibility in teaching and assessing that respects the diversity of students. There is no place for a single set of curriculum materials, a single way of testing, or a set pace for learning. Instead, there are many different ways for students to move through their learning careers in school – multiple paths to accomplishment and ways to demonstrate the important learning outcomes.

Creating a Learning Environment

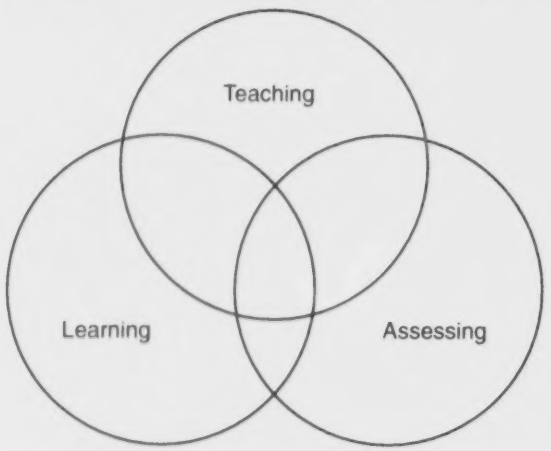
Schools in which learning drives teaching and assessment (**Figure 2**) are apt to serve more students well than those working from more traditional models (**Figure 1**). However, expanding students' repertoires around how they learn and teachers around how they teach and assess will not work in schools where learning, teaching, and assessing occur separately. There is simply not enough time in the day; the image of so much activity is enough to set anyone's head spinning. Learning, teaching, and assessing can no longer be thought of as separate activities; they must be connected in ways that make them part of one another to the point that they are often indistinguishable.

Fostering the successful development of every student requires rethinking the very nature of learning, teaching, and assessing so that all activities have more than one purpose and everyone plays more than one role. Learning experiences also serve as self-assessment; teaching doubles as

learning. Roles become less distinct; learners are also assessors and teachers, teachers are also learners, and so on.

The more that activities and roles serve multiple purposes and focus on multiple outcomes, the more powerful becomes the connection among learning, teaching, and assessing – to the point of overlapping. In an ideal learning environment, the focus is on the intersection of learning, teaching, and assessing, as in **Figure 3** below.

Figure 3: A Model Connecting Learning, Teaching, and Assessing



The greater the overlap, the more likely the learning environment will look like this:

- Expectations, activities, processes, and structures demonstrate the belief that *all* students can develop as successful learners.
- Adults and students engage in meaningful work that has several purposes.
- Adults and students share an understanding of the purpose of their work. This understanding is continually revisited and refined; it guides all work.
- Adults and students change roles and responsibilities as they develop and integrate the skills of learning, teaching, and assessing.
- Everyone participates in ongoing inquiry into learning, teaching, and assessing. Next steps are based on what is discovered through that inquiry.
- The student's home, school, community, and larger world are woven together to foster more meaningful learning, since everything about the student is considered important.

- Learning, teaching, and assessing come from a shared framework based on research and effective practice.
- New definitions of responsibility and accountability unite students and adults in continuous improvement based on rigorous standards.

It is only in learning environments such as these that what Darling-Hammond (1993) calls "a new mission for education" can be pursued:

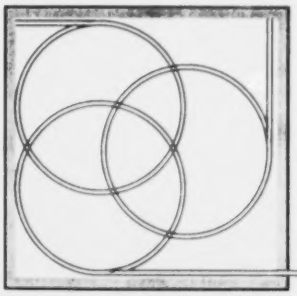
> *. . . [O]ne that requires schools not merely to "deliver instructional services" but to ensure that all students learn at high levels. In turn, the teacher's job is no longer to "cover the curriculum," but to enable diverse learners to construct their own knowledge and to develop their talents in effective and powerful ways (754).*

A Preview of This Guide

This guide describes a process to help communities think about and design schools where learning, teaching, and assessing are strongly connected. Chapter One, "Initiating and Sustaining a Process of Community Inquiry," depicts a process that can result in a learning-driven education for all students. It discusses the definition of *community* as it relates to schools, the role of a multiconstituent design team in leading the redesign effort, and the tasks the team needs to undertake. Chapter Two, "Learning," discusses and illustrates principles of learning and development, and describes current work to redefine learning outcomes that are important for all students.

Chapter Three, "Assessing," presents current thinking about assessment and issues that need to be considered as assessment takes on a broader role in learning. A set of principles to help guide discussions and a variety of approaches that are currently being used and developed are described. Chapter Four, "Getting to the Intersection of Learning, Teaching, and Assessing," describes principles for designing new learning environments, considering the issues and struggles faced by all members of the community with a vested interest in their success.

We think of this guide as both an invitation for those who want to embark on this journey and a tool to use on the way. As the old saying goes, "If you don't know where you're going, any old road will do." Defining where to go, therefore, is a major part of the process of change in education. Any old road will not do. Each community will need to develop and articulate its own goals and standards for learners and think together carefully about the implications for teaching and assessing. This text offers guidance, ideas, resources, and encouragement as you embark on the road. We hope it informs decisions and choices along the way.



Chapter One
Initiating and Sustaining a Process of Community Inquiry

It takes a whole village to raise a child.
– African proverb

Transforming schools so that they prepare *all* students for life in the twenty-first century requires the entire community to be engaged in discussions and decisions about learning, its assessment, and the teaching that promotes it. Community members have a lot to learn, but more importantly, they have much to contribute, as they support students' attempts to learn from their experiences – of a single day, across the years, among home, school, and the larger community.

This chapter describes various ways to involve members of the community in inquiry into the key dimensions of education. We address the following questions:

- What is *inquiry* and why get involved in an inquiry process?
- What is *community*? Why should inquiry into learning, teaching, and assessing be community-wide?
- How can this guide support the process of community inquiry focused on educational reform?
- How can a community initiate and sustain a process for developing consensus about learning, teaching, and assessing? What role can a multiconstituent design team play?

Inquiry into Learning, Teaching, and Assessing

Inquiry is an active process of participation and collaboration, of questioning and dialogue, among students, teachers, administrators, parents, and other concerned members of the community. It serves to develop common understandings and goals, pursuing complex questions and issues that benefit from multiple perspectives and require ownership by the various people whose lives are touched by their resolution. It is both a

process for making decisions (for example, about valuable learning outcomes) and for exploring issues that have no ready solutions (for example, how to maximize limited and dwindling community resources). It engages interested community members in ongoing learning and development – providing those outside the formal educational system with the kinds of opportunities for personal and community growth that are also important for young people served by the system.

The community inquiry process can have a number of purposes. Some of these are to:

- invite the community to focus on *all* students and their learning, determining what they want students to know and be able to do;
- spread awareness and deepen understanding of the work in learning, teaching, and assessing that has been done over the last 25 years;
- develop a common language to use in talking about learners and learning, teaching, and assessing;
- discuss the role of the community as teacher and the types of learning experiences that help young people develop in school and out;
- identify resources that can be used in learning, teaching, and assessing;
- study methods of assessing how and what students are learning in ways that foster further learning and teaching;
- develop a working consensus about student outcomes, criteria, and standards;
- motivate adults and young people to pursue questions about learning, teaching, and assessing; and
- develop structures and processes that focus and direct energy toward building learning-centered schools over the short term, the mid term, and the long haul.

Defining Community

Successfully supporting education requires ever-expanding notions of what *community* is. By *community*, we mean the geographic area – the neighborhood, district, town, or city – in which a school is located. But community also means people – everyone who has a stake in the successful development of young people, which includes not only those who have children in the schools, but all citizens. The social contract that is part of our Jeffersonian democracy requires an educated citizenry that now means *all* citizens and community members.

Community also refers to places of learning. While this guide often talks about what goes on "in school," because most formal education occurs

A first-grade teacher has spent 15 years working on her own and with others around the country developing alternative assessment strategies and building a learning-centered classroom. She is now known for her work. Within her school, each day parents gather, eager to observe their children's work, the science journals their children keep, and the thoughtful and attentive dialogue about their current learning adventure that takes place in a circle, just after the children get their coats off. Her classroom is alive with activity and bursting with materials. She keeps an ongoing record, or portfolios, of the students' work, open to regular review by children and their parents. Her classroom is a very full place.

Yet, she works in isolation in her school. Barely another teacher knows what she is doing. Her "community" within the school is the temporary one she builds with her students each year, only to begin all over again the next year. When her students finish the year, their cumulative records of papers, drawings, and all other evidence of their learning are lost. Next year's teacher will not know the child who agonized over feeling confident enough to put words to paper, will not even know that this child really understands the metamorphosis of butterflies, or can now write and illustrate great dialogues.

there, we invite readers to think more broadly about all the places where young people learn and where teaching and assessing occur. Weaving those experiences together not only can foster greater learning on the part of youth, but also deepen understanding and commitment by those charged with raising them.

Most people are fortunate enough to remember having a teacher who created a classroom environment where learning couldn't help but thrive. Such teachers exist today in many communities, but often they work alone, unconnected to the rest of the school and to the surrounding community. While it is true that they have been able to give their students an opportunity for real learning, that isn't enough. Young people need their education to make sense to them over time; it should not be *their* responsibility alone to think about the coherence and continuity of their learning experiences as they progress through the grades and venture into their community. Instead, it is the responsibility of the community as a whole – its educators, service agencies, businesses, and professionals to see the big picture and create a larger, more connected learning environment for its youth.

Involving the community in decisions about education builds shared accountability for educating young people. Rather than waiting with folded arms to react to a school's annual progress report with a thumbs-up or thumbs-down, the community must share with the school an understanding of what the education system is trying to accomplish, how its progress is to be reported, and what the reports really mean. Rather than playing the game of who is to blame, community and school have a pact to determine together what is desired, how to achieve it, and what to do if things don't go as planned.

Developing such an attitude of shared accountability is not as simple and linear as it may sound. With its continuous adjustments, the inquiry process is complicated. Yet there is mounting evidence (Thomas et al. 1989; Fullan 1991) that the process can shift the relationship between school and community from "show me you'll do your part, then I'll do mine," to "our goals for our young people are the same. . . . How can we work together to accomplish them?"

How This Guide Can Support Community Inquiry

In the inquiry process, individuals examine their beliefs, values, knowledge, and practices, and look at, analyze, critique, and distill what others have done or are doing. This guide supports this process by providing several types of information in text and graphic forms including:

- summaries of research and current thinking in learning and assessment (these are in italics throughout the text);

- stories and examples from real communities and schools developing new ways to think about and engage in learning, teaching, and assessing. Some of these descriptions are from teachers and schools in this region and are so identified; others are compiled from the experiences of the authors and others who work with schools (all of these are set apart in text boxes);

- ideas to stimulate new thinking around connecting learning, teaching, and assessing (these appear in shaded boxes throughout the text);

- activities that the design team and community groups can use to engage with print and other materials, and to examine their own thinking and beliefs; and

- references to additional materials that might be helpful; for example, while there is a large bibliography at the end of the guide, each chapter ends with a short list of "must read" references.

The guide begins in the learning domain; what do we want our students to know and be able to do? This is where a successful inquiry process is likely to start. The teaching domain does not have its own chapter for three reasons. First, there are many other resources available that focus on teaching and instruction that can achieve the same purposes as this guide (see, for example, Joyce and Weil 1986; Marzano 1992; Cohen et al. 1993; Joyce et al. 1993). Second, although it is important for the community to be involved in decisions about teaching (i.e., what specifically is taught and how), it is even more important for the community to be involved in decisions about learning and assessment of learning, since there is less information available and generally fewer opportunities for community involvement in these domains. Finally, community involvement in teaching occurs most frequently around decisions regarding the curriculum (what should be taught). This guide addresses the more fundamental question of what should be *learned* in the learning domain. The resources we offer here support the most critical areas of community work, learning, and assessing.

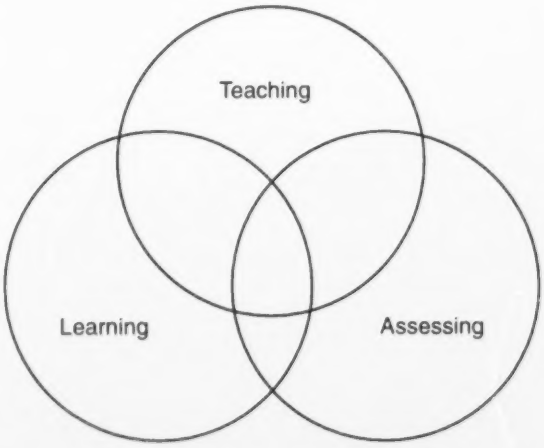
What is included here is just a beginning. Communities we have worked with have found these particular resources helpful in the inquiry process. We encourage you to seek out and use other resources as well; some you might consider are referenced throughout the guide.

Developing a Community Consensus around Learning, Teaching, and Assessing

Figure 4 on page 5 depicts the goals for community inquiry in each of the three domains. The inquiry process begins with learning, addressing the critical questions: How do people learn? and What do we want all our students to know and be able to do? Beginning here is important for two reasons. First, the deep understanding and shared values and language that

the community develops by spending time exploring learners and learning form the foundation on which all other understanding and decisions will be made. What and how to teach, and how to assess progress, come from understanding how learning occurs, and rest on decisions about what young people need to know and be able to do. Second, a community that is involved with decisions about learning is more committed and better able to support young people in their development and the adults who work with them.

Figure 4: Purposes for Inquiry into Learning, Teaching, and Assessing



Learning:

- To understand how children develop and what their questions are.
- To understand what is known about how people learn.
- To come to consensus about what students should know and be able to do.

Teaching:

- To understand what is being taught and how.
- To develop appreciation of the roles of professional educators.

Assessing:

- To understand effective assessment and a variety of assessment methods.
- To participate in decisions about student assessment and how to report results.

Decisions in the learning domain center around the question of what all students should know and be able to do. The community develops a

shared vision of the successful graduate, an individual whose knowledge, skills, and attitudes are developed, at least in part, in the community's schools. At the most general level, the community comes to consensus on characteristics of the educated citizen. Then broad outcomes are identified, with standards and criteria for knowing when they are reached. Finally, benchmarks are determined against which students' progress can be measured – they help indicate how far a student has progressed toward a standard. These terms are clarified, with examples, in the next chapter.

With these decisions about learning as a foundation, the process can then move to consider teaching, that is, curriculum and instruction. The specifics of what is taught and how it is taught tend to be left to professional educators. However, to support the education system, community members need to understand how knowledge about learning should influence the design of learning experiences. They need to consider how curriculum and teaching need to change so that students can reach the goals set by the community.

The extent of community participation in the teaching domain varies. In some districts, community members serve on curriculum development committees. In others, segments of the community, for example, businesses and research laboratories, conduct their own instructional programs in collaboration with schools. Regardless of how involved different community members are in decisions about teaching, they need to understand what is being taught and how, why this is so, and what roles various professionals play to design and support student learning experiences.

At an elementary school in an Hispanic and Native American community in the southwestern United States, an inquiry about students began with everyone who wanted to participate – teachers, the school secretary, the principal, a professor from a local university, and some community workers. Although they had never talked much among themselves, they began by asking questions about the students – why they were so passive, why they didn't seem to learn, why they fought among themselves, why they had such low self-esteem.

As the group looked for answers, they gradually began to see that their actions, expectations, and assumptions had a lot to do with the behaviors and attitudes of the students. Over time, they began to make changes, small ones at first, in the way they related to the students. They designed learning experiences that promoted active participation and allowed choice. They realized that the children were capable of so much more than they had thought. They began to talk about what they wanted their

(continued)

students to know and be able to do. Some teachers began to team – "regular" with bilingual or English as a Second Language (ESL) teachers, and across grade levels – in order to have multiage, multilingual groups of children. The learning curve for the teachers was very steep as they experimented with approaches they had never tried before and observed the children to see what happened.

While many school staff learned to talk together and organize their work better for students, there were tensions between them and parents. Each side felt threatened and not valued by the other. Meanwhile, a second group began to talk about student learning – a group of parents and others from the community, along with some teachers, school district staff, business people, and city government representatives. Because of the tensions between the school and community, this group limited its inquiry to student educational experiences outside the school day, such as community center activities.

The school group and community group continued to operate separately. Then, parents began to see different attitudes and behaviors in their children that they believed were due to the changes that the school staff had made. Our children are not so bored, they said, and they are becoming leaders, helping other children as well as being helped. They are fighting a lot less and are speaking up in class. While the parents still had lots of questions to ask of the teachers, they began to think more positively about the school.

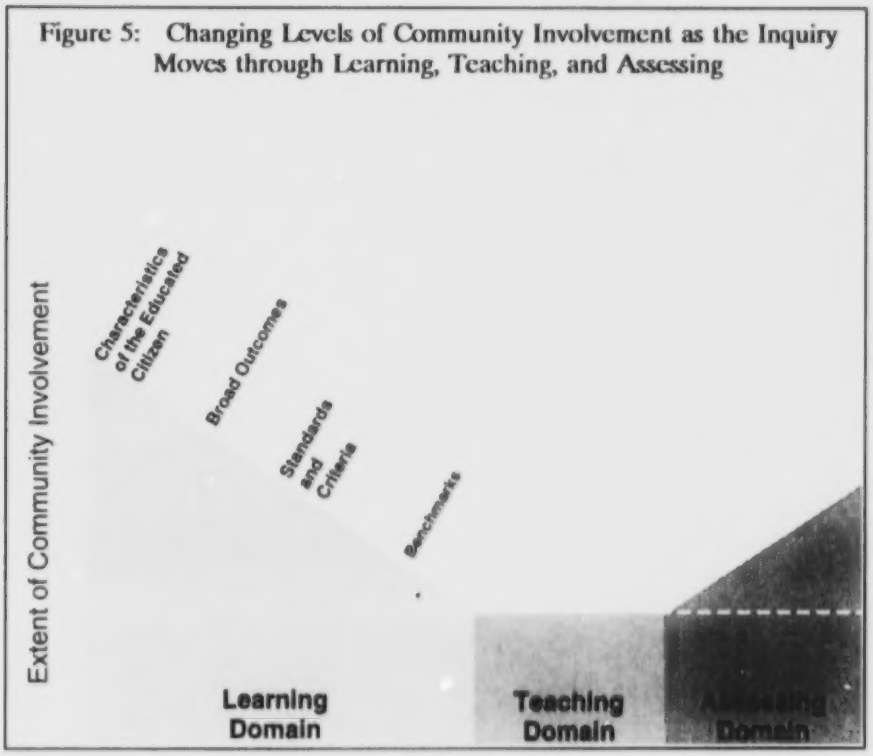
Then one day, some of the students asked why the many vacant lots in their community were filled with trash, including drug paraphernalia. Their teachers and parents, who had long taken this for granted, said essentially, "That's just the way it is." The students decided it didn't have to be that way. Soon, students, teachers, parents, and other community members were working together to clean the lots. More than 100 residents gathered in the schoolyard to hear the students ask their local city councilman what he would do to help them keep the lots clean. This effort energized the community to come together and begin to look collaboratively at what they wanted for young people and the community.

Finally, the community engages with assessment to learn about the nature and purposes of assessment and to participate in decisions about assessment methods and reporting. As with the teaching domain, the extent of involvement of communities in assessment can vary. However, since the results of testing have often been of great concern to communities, it is critical that more people become part of an effort to expand what is assessed, how it is assessed, and how the results are used – that is, to rethink the role and methods of assessment so it truly supports learning.

The extent of community involvement in each of the domains is illustrated by **Figure 5** on page 8. Although each community will have to determine who will be involved for what purposes, scarce time and resources for in-

depth inquiry will probably allow less attention to specifics as the process moves from learning to teaching and assessing. The dashed line reflects the practice in some communities of getting nearly as involved in assessment as in learning.

Figure 5: Changing Levels of Community Involvement as the Inquiry Moves through Learning, Teaching, and Assessing



As we describe how a community moves through the inquiry process, it is important to keep several things in mind. First, the process is not as linear as it sounds. We have chosen to present it as step-by-step so that it is understandable, but in reality, inquiry is likely to occur simultaneously in more than one domain. Communities may choose to begin at different places and to involve different people in different parts of the process. While we propose the components of a process here, we also provide several examples of how different communities have approached their own inquiry. Ultimately, you and your community will have to decide what suits your needs and reality.

Launching the Inquiry Process

Who sponsors the inquiry process? Depending on the community, it may be best sponsored by a neutral party — a community foundation, for example, so no one group or institution either controls the process or becomes the target. An alternative is to make it a cross-organization initiative so it can draw on the resources, constituents, and strengths of a

broad spectrum of the community; this will also ensure stability when key leaders leave, as often happens in communities. In some states, recent educational reform initiatives have included provisions for school/community groups who are empowered to oversee school improvement initiatives. Such groups might be the logical sponsors of the inquiry process.

Whoever initiates the process of community inquiry needs first to determine its scope. Will the community be the entire school district, or will it begin with one school's community? Starting small may be particularly prudent in urban settings, where managing such an effort in even just one neighborhood may be a significant undertaking. There is no one best way. Rather, it is important to know the politics and culture of the community and to consider how to strategically involve people of all roles and interests.

Using a Design Team to Steer the Process

A multiconstituent design team can coordinate the community inquiry process. Representing the major stakeholders, with time and resources to meet regularly, a design team constitutes a microcosm of the community. It should be able to identify assumptions, issues, and problems, and lead the process in a strategic way. Having all parties represented from the start is one way of ensuring that the design team is diverse across several categories, such as:

- role (for example, educators, parents, businesspeople, health and human service staff, local government staff);
- opinion group (for example, religions, political factions);
- background (for example, race, ethnicity, socioeconomic); and
- styles (for example, "thinkers," "doers").

Consider choosing team members who are in positions of power, such as the school board chair or the CEO of the largest company.

It may be tempting to include people who are known to be of like mind. This may make it easier to get started, but it is likely to cause problems down the road when other groups are forgotten, ignored, or otherwise excluded. As one weary but wiser educator commented about including diverse, sometimes conflicting, perspectives from the beginning, "I got tired of fighting brush fires at every turn of the road caused by people whose voices had not been heard." If someone who leads a particular group is a total troublemaker, that might exclude him or her, but it is best to have the vocal groups represented at the table, or they are apt to cause dissent outside.

How many design team members should there be? It depends on how the design team is going to work and what its tasks are. If the group is larger than 10, getting together is often difficult, so a smaller steering group may be needed to make many of the operating decisions.

Most would agree that a facilitator is valuable for helping the team achieve its purposes – someone from outside the community, or at least an insider who is able to maintain reasonable neutrality and help the group grapple with difficult issues. Someone with facilitation skills is key to moving the process along.

Tasks of the Design Team

The primary role of the design team is to oversee all parts of the inquiry process and keep it moving productively. How much they actually lead – that is, facilitate the work of subgroups – depends on their charge and mission.

Here we discuss some of the tasks that most design teams undertake as they focus the community on education. One useful early step is to have the team discuss which of these tasks it will do:

- connect to where the community is now;
- establish new working relationships;
- invite the community to participate and maintaining the momentum;
- keep an eye on purpose;
- marshal resources;
- create conditions for learning; and
- arrange learning experiences.

ACTIVITY ONE

The Journey is a tool for mapping where you are, how you got there, and where you want to go. The design team could use it not only to help people acknowledge from the start where they are, but to keep track of where the effort is going and what progress is made along the way. Guidelines for drafting a journey are included in Appendix A-1.

Connect to Where the Community Is Now

Once the design team is organized, its first job is to understand where the community is in its work in terms of designing schools for all students, especially regarding learning, teaching, and assessing. This is necessary so that the design team can frame its overall role and responsibilities within the real context of the community's history and accomplishments.

Perhaps some groups of teachers, parents, or businesspeople have been doing work with similar goals. Or perhaps the school district has already identified outcomes – that is, what students should know and be able to do (the first phase in the inquiry process).

The design team will also want to know what the community's history is regarding the use of inclusive teams in key roles. They will want to know the relationships between school staff and parents and other community members, between students and staff, and so on. They'll need to identify

any conflicts, such as those between parents of students who traditionally do well in school and want to maintain the status quo and parents of children who traditionally do poorly in school and feel victimized. Knowing about the community's history and culture will enable the design team to predict some of these issues and to create opportunities for diverse people to come together in a productive way.

Establish New Working Relationships

Who is the community? Who should be invited to participate in some way? Some of the groups to consider in a community are:

students
parents
teachers and other school staff
school board members
neighbors
businesspeople and chambers of commerce
human service and health professionals
community service providers and community-based organizations
higher-education faculty and other assistance providers
religious officials and congregations
local government services, including libraries, police, justice
community foundation personnel
members of fraternal organizations and affiliations
union members
retirees

In many localities, these people may never have been in the same room together. There may be tensions, fear, antipathy, and even hostility between and among groups. Yet everyone must have the opportunity to be involved in some way in the community inquiry process.

Because of the way most people view their work, it never occurs to them that their jobs may be connected in some way. Even those who work directly with children and their families may focus on their specific jobs, not on the contribution of their work to raising the young. In many communities, this is changing, as community organizations begin to focus on families, but the transformation is by no means complete.

Getting many types of people involved is important because the resources are tight and the needs of young people are great. Some people think, for example, that the work of health professionals is pretty distant from learning outcomes. But if one valued learning outcome is knowing about one's body and mind and developing the ability to make healthy choices, there's no question about the connection. "Is that education or is that health?" asked an assistant superintendent in a Texas city. The people in Texas decided it was both education and health — and therefore the work of both teachers and nurses — and that it did not matter as long as everyone got together to support young people.

Invite the Community to Participate and Maintain Momentum

The inquiry process is an invitation to learn. The design team is responsible for ensuring that a broad spectrum of the community is involved not only for the benefit of improving the school(s) but also for the benefit of their young people.

The tendency of any group that initiates such a process, whether businesspeople, educators, parents, or others, is to "keep it in the family" – that is, to invite others to participate in an effort only after they've gotten their house in order. This can be a real mistake because by "protecting" others from the messiness of the first phases of the process, the initiating group also keeps them from understanding why certain changes are being explored, what the changes are all about, and why they need to be involved. What may seem like an obvious conclusion or decision to the initiators who have been thinking about the issues for some time may be new and confusing to others. As Marris (1975) observes, the initiating group cannot develop understanding in others; each person has to create his or her own:

> *When those who have the power to manipulate changes act as if they have only to explain, and when their explanations are not at once accepted, shrug off opposition as ignorance or prejudice, they express a profound contempt for the meaning of lives other than their own. For the reformers have already assimilated these changes to their purposes, and worked out a reformulation which makes sense to them, perhaps through months or years of analysis and debate. If they deny others the chance to do the same, they treat them as puppets dangling by the threads of their own conceptions (166).*

A special note to educators: Because districts and schools are so often the target of initiatives rather than partners in them, educators may want to control a design effort to avoid that fate. However, in so doing, the school runs the danger of sending the message that it can be all things to all people. The real message is that the entire community should be learning to focus on its young and contribute to their growth and learning – in school and out.

The job of the design team is to facilitate the community inquiry and maintain its integrity as an invitation to learn, not a forced march to predetermined answers. In the beginning, the team will take responsibility for designing experiences and convening people, but if care is taken to involve others, then groups may form that proceed to work on different aspects of the inquiry.

The invitation to the community must be a standing one. More and more people need to become involved and woven into the process as time goes on. The aim is to reach everyone in the community in some way.

Keep an Eye on Purpose

Of the purposes for community inquiry listed at the beginning of the chapter, the first is the most important: to invite the community to focus on ALL students and their learning, and what students should know and be able to do as a result of their time in the community. Although this seems quite straightforward, it is easy for discussion of changing education to stray from a focus on all students. For example, when teachers are asked to talk about what counts as good learning, many focus on instructional goals or curriculum objectives. Parents talk about what they *wish* their children would do rather than understand what they *are* doing. Others focus on programs and projects to benefit the young. So an important job and ongoing responsibility of the design team is to help participants in the community inquiry keep their focus on the learning process and valuable learning outcomes. Then, when those discussions form a solid base, they can move to inquiry into how to make those happen within the community.

Marshal Resources

Knowledge is an essential part of rich learning experiences. In this guide, we include information from certain lines of research and the experiences we have had with our colleagues in a wide variety of communities. The design team should be sure to explore a variety of perspectives through sources in addition to this guide. Community participants are likely to suggest materials they think are worthwhile to consider as well as people who would be helpful to talk with.

ACTIVITY TWO

The Powerful Learning Experience is a useful activity to conduct early on as a community comes together to begin rethinking education for all students, that is, as they begin to learn together. It helps people get in touch with the learner in each of them and results in some understandings about the characteristics of meaningful learning experiences. It is described in Appendix A-2.

Create Conditions for Learning

An inquiry process is a journey in learning. Creating a climate where people are treated with respect, where they feel safe enough to take risks, and where such rights and responsibilities are articulated in ground rules and maintained by participants is essential. At the same time, for real learning to take place, people need to challenge their assumptions and beliefs about learning, schooling, and so on, and to consider others' points of view. The type of learning environment called for may be termed "safe but not comfortable," for a certain amount of discomfort usually accompanies changes in thinking (i.e., learning).

Arrange Learning Experiences

Designing sessions for the design team itself, for a broader segment of the community, or for smaller working groups within the community, requires skills in organizing, planning, and facilitating learning experiences for adults and mixed groups. Although this book is not a detailed guide for doing this, throughout this resource we suggest some activities for the design team and community to use in their inquiry process. We also suggest when the activities could be used and in what order.

Summary

The design team tasks described here are only a beginning. We urge you to draw widely from the community for the broadest range of perspectives and resources, as well as expertise in designing and carrying out the learning experiences that will make the inquiry process succeed. As noted before, we are not interested in proposing a step-by-step process. Every community will approach their inquiry process differently and should adapt this guide to suit its needs. The chapters that follow, however, will help provide you with a place to begin.

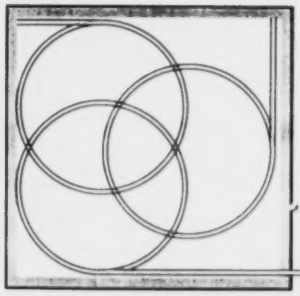
Recommended Resources

Cox, Pat L. and Jane deFrees. 1991. *Work in Progress: Restructuring in Ten Maine Schools*. Andover, MA and Augusta, ME: The Regional Laboratory for Educational Improvement of the Northeast and Islands and Maine Department of Education.

Eisner, Elliott W. February 1991. "What Really Counts in Schools." *Educational Leadership* 48 (5): 10-11, 14-17.

Oakes, Jeannie and Martin Lipton. 1990. *Making the Best of Schools: A Handbook for Parents, Teachers and Policymakers*. New Haven: Yale University Press.

Resnick, Lauren B. 1990. *Assessment and Education Standards, Video #1*. Pittsburgh: University of Pittsburgh.



Chapter Two
Learning

To build a strong foundation for a new system of education, communities need to first tackle three questions: How do people learn? What do we want our students to know and be able to do? and, How do children develop and what are their essential questions? Rarely do educators, let alone the wider community, have the opportunity to address such critical questions in ways that allow them to examine and discuss the research and literature, their own experiences, hopes, and beliefs, and the efforts of others. This chapter fuels inquiry into learning through discussion of:

- beliefs about learning;
- principles of learning based on research and experience; and
- community efforts to determine learning outcomes for students.

Examining Beliefs about Learning

Everyone has ideas about how young people learn, about what successful learning looks like, and about what constitutes intelligence. These ideas may or may not be explicit. It is important that people considering new definitions of student success recognize and examine the beliefs they currently hold. How a community makes sense of notions such as "ability," "intelligence," and "success" sets the stage for the development of shared commitments toward learning.

ACTIVITY THREE

The Four Corners Activity is a tool to help people get their beliefs and values on the table. It can be a useful activity early in the process of working together to build shared language and vision. It is included in Appendix A-3.

What are some views of learning that underlie how education is organized and that community members may hold? Much of schooling in the United States is still organized around late nineteenth century educational thinking that human ability is innate, fixed at birth. Subscribing to that theory means that the role of education is to sort students by what they can be expected to achieve and then teach them accordingly. Many of our current practices are rooted in this belief system and do not take into account what we now know about how students learn. As Resnick (1990a) notes, "It's as if we don't believe that children can learn if they try hard and if they are taught well."

Yet people know instinctively that there are different ways to be "smart." If communities believe in the potential for success of all young people,

then their definition of intelligence must shift from "representation by a single test score" to something more like "the ability to perform certain tasks or competencies that the community agrees are necessary for a productive life."

Deborah Meier, principal of Central Park East High School in New York City, agrees with Resnick's observation that many people operate from an obsolete paradigm of learning:

> *We, all of us, have at least thirteen years of experience to support our belief that teaching is telling and learning is remembering. That's an awful hard habit to overcome. (Public Broadcasting Systems 1990)*

Learning defined as "remembering" is a vestige from the early times of schooling when learning goals were basic literacy and numeracy. Most community members have had many educational experiences based on the theory that repeated drill and practice results in remembering, which equates to learning. Although some information basic to today's goals can be learned through drill and practice, there is a great deal of knowledge that requires a different paradigm of learning — one of building understanding and making connections over time. How deep understanding develops is complicated and based on principles of learning such as those discussed in the next section.

Principles of Learning

Over the last decade, much has been learned about how people learn. We have taken the research and theory on learning and shaped them into the 12 learning principles that follow. The list is not meant to be comprehensive; you may wish to add to it or sort the research on learning in different ways. Others have developed their own lists, including the American Psychological Association (APA), whose learning principles we have included in Appendix C-1. The following learning principles are expanded upon later:

1. People are born learners.
2. People seek to understand new information and experiences by connecting them to what they already know.
3. People learn in different ways.
4. Thinking about one's own thinking improves performance and the ability to work independently.
5. Individuals' stages of development affect learning.

6. Although people may naturally make connections as they learn, they often need help to transfer knowledge to different contexts.

7. A repertoire of strategies enhances learning.

8. Certain dispositions, attitudes, and habits of mind facilitate learning.

9. Working with others of different styles and perspectives enhances learning.

10. Those who do the work do the learning.

11. A resource-rich environment facilitates learning.

12. Developing shared understandings about what constitutes quality work fosters learning.

1. People Are Born Learners

Children are naturally curious. They are born intrinsically motivated to learn. From discovering themselves to making sense of everything that surrounds them, curiosity is a constantly present spur that leads them forward in their process of achieving knowledge, understanding, and growth. They wonder about how the world works and yearn to make sense of it. A healthy child left on his or her own with resource materials will automatically begin to explore and experiment. Strong and active curiosity, an inclination to question, and a desire to find answers are marks of a good learner.

Since every young person has a unique set of experiences, perspectives, and concerns, their curiosity leads them down different roads. For learning to occur, it is crucial to address needs and foster interests that individuals view as relevant. If the themes, issues, and practices taken up within the classroom are unrelated to the experiences and expectations of the home or the wider community to which the child belongs, then participating in or assimilating school learning may be difficult or impossible.

Therefore, an essential aspect of the effort to construct learning-centered schools is finding ways to build continuity in a young person's life between experience in and out of school. As a whole, the community-guided process proposed in this guide is a key vehicle to forge this link. Yet in each case, a parent's or teacher's awareness of a young person's questions, and their willingness to encourage and pursue them, is one of the primary ways in which the connection may be established and strengthened.

Although young people's curiosity is often directed at things immediately related to their own experiences, there are certain themes that appear at the center of their interests. As Carini (1982) points out, each child will be attracted to these themes or issues, and led along particular paths. "To

hear the voices the child hears and to follow pathways alongside the child opens for the teacher and parent a natural and continuing access to the experiences that will nourish and further the child's growth" (74). Among the themes Carini has recorded through her years of observing children are: the origins and hidden sources of life, identity, kinship and community, survival, cycles and change, the forces of nature, and the inner forces of feeling and will, beauty and harmony, security and freedom. These themes surely are as relevant to young people as they approach adulthood as they are to the younger children Carini has worked with. Understanding the themes that "call to" young people can help teachers, parents, and other adults find ways to make learning easier, more accessible, and more interesting for young people.

Many years ago at City College of New York, I learned from Lillian Weber that at the heart of "learning-centered" schools are questions that children ask: that children's natural curiosity is the motor that drives learning. Of course, these questions don't occur in a vacuum, so how we structure the learning environment and what we include or exclude from our curriculum significantly influences the opportunity children have to raise and explore questions about the world.

When I think of this important idea, I remember a child named Kaman. Kaman had come from Cambodia a year before entering my class as a second grader. That year she studied a maple tree in order to find out how it changed color in the fall. As part of a "change" theme the class had brainstormed natural changes that occur in the fall, and Kaman had chosen to investigate this particular tree, which we could see from our classroom window. She kept a journal, making many careful drawings and writing about her observations. At the end of her investigation, she made a poster summarizing what she had learned: that there was sequence to the color changes, which occurred at different times throughout the tree. She was understandably proud of her work.

The next year Kaman was back in my multiage class as a third grader and we were preparing to launch a new theme for the year. Kaman told me that she wanted to study the tree again to see if it changed color in the same sequence as last year. I just assumed it would change the same way, and I tried to lead her to this conclusion through talking with her. I felt it would be a better use of her time to investigate something else. She convinced me that this was something that was really important to her, and so I decided to let her do it. (She probably wouldn't have needed as much time to convince me if I had William Glasser's quote up in my room, as I do now, that children "learn 20% of what they hear" and "80% of what they experience personally.") So Kaman embarked on her new investigation. It was interesting to see the improvement of her writing and drawing skills. Again, I just assumed the tree would change the same sequence of colors and that Kaman just needed to see that for herself.

(continued)

Well, wouldn't you know that soon into her investigation, Kaman discovered that the maple tree skipped yellow in its color sequence. I was amazed. We contacted biologists at the University of Vermont to find out why this had happened. They couldn't provide an answer.

Several years later, I was taking a hands-on science course at Shelburne Farms in Vermont, and we had a visit from a tree expert. I mentioned to him what had happened to "Kaman's tree." He said he remembered that year and that scientists really couldn't offer an explanation other than to say it sometimes happens.

Regardless of what would have happened to the tree in the second year of its investigation, it was clearly important for Kaman to pursue her question through her own direct investigation. The results of her investigation have only served to reinforce the importance of what I learned at City College a long time ago: that the opportunity for children to raise and pursue their own questions is an essential component of learning-centered schools.

• • •

Addendum: What a coincidence! Last week one of my old students, now in 10th grade, came back to visit. During our conversation, he looked out the window and said, "I still remember Kaman's tree."

– Brent K. Sclafani, Teacher
Lawrence Barnes Elementary School
Burlington, VT

2. People Seek to Understand New Information and Experiences by Connecting Them to What They Already Know

All people attempt to make sense of their experiences by creating explanations that are consistent within their own framework or belief system, whether or not the explanations would be considered valid from the perspective of others. We progress from simpler mental models to more complex ones, rather than from facts to comprehension (understanding how the facts fit together) to analysis (being able to understand their relationship to each other). Thus, "basic skills" are not, as had been traditionally thought, the building blocks of learning. Learners' basic concepts, their own constructions of understanding, are the real building blocks. Helping learners make their own connections among concepts, and among the various parts of concepts, reinforces and deepens their understanding. For meaningful learning to occur, new knowledge must connect to prior knowledge – that is, with the information and experience already existing in the learner's repertoire.

In connecting new information and experiences to already existing ideas, learners tend to maintain their internally coherent frameworks, elaborating them or fundamentally altering them only in the face of experience that

directly challenges them. The connections that individuals make are unique even when the information is the same because each person perceives experiences differently.

A toddler building a Lego structure on her own automatically asks questions and experiments to discover the physical principles of how the world works. As she adds Legos to different parts and the "tower" grows, the child talks to herself: "What if I put one here? Oh! It fell over. How about if I put one here?" She is experimenting, learning about balance, not by being told, but by simple and self-guided experimentation. A time will come later for this child to learn the scientific principles for what she has discovered on her own. By then, she will have at her disposal a practical experience base from which to make sense of those principles, as well as a language in which to talk about and explain them to others.

In this view of learning, it is easy to see why people cannot understand new things simply by being told them; they have to "construct" their own knowledge. The "constructivist" theory of learning suggests that, in order to create their own knowledge, learners start by formulating questions from their experiences and knowledge (Meek 1991). Sometimes these questions emerge from the discrepancies between what the learner believes and what he or she witnesses in reality. Questions can also be posed by others.

The learner explores those questions through experimentation and interaction with a variety of resources over time. The learner can then construct theories in answer to the questions, and go on to prove or disprove them, often through trial and error. Simultaneous and subsequent reflection on the process and its results is a key factor in the pursuit of this road. A constructivist approach to learning is more in keeping with the natural learning processes young people employ from infancy. At an early age, they can learn to form and investigate their own questions.

The theory of constructing knowledge for oneself in order to gain deep understanding is not a recent idea. In Piaget's (1952) view of the "construction of knowledge," the learner's experience is such that, for each question answered, new problems or mysteries unfold at increasingly higher levels. Vygotsky's (1978) notion of "spontaneous concepts" describes how children discover knowledge through direct experience. He also shows how social interaction can enhance an individual's learning. This is an important point, because it underlines why teachers and others need to guide and mediate the learning process.

3. People Learn in Different Ways

Much work has been done on differences among learners, particularly in terms of their styles of learning (Dunn et al. 1989) and the different ways they exhibit their intelligence. Gardner's Theory of Multiple Intelligences (1985) has been of particular interest to many communities redesigning their schools so all students learn. This theory looks at learners' strengths and weaknesses across seven different kinds of intelligences (see **Figure 6** on page 21), e.g., linguistic, logical/mathematical, and interpersonal. These competencies or "types of intelligences" are valued differently by different cultures and professions. Only a couple, notably linguistic and logical/mathematical, have traditionally been valued by our schools; this is why students with only exceptional social skills or artistic talents are rarely, if ever, at the top of their class. Gardner believes that schools should foster the development of well-balanced students – that students should be encouraged to develop in all the intelligences – while acknowledging that individuals have areas of natural strength.

Teachers of young children use a "multiple intelligences" approach when teaching mathematics through bodily-kinesthetic intelligence: by using manipulatives and sometimes children's whole bodies. Teachers of middle- and upper-grade students teach interpersonal intelligence, such as getting along with peers, and intrapersonal intelligence, such as self-confidence, by creating a nonthreatening, open, collaborative environment.

Figure 6: Gardner's Seven Intelligences

Bodily-Kinesthetic: ability to control one's body movements and to handle objects skillfully (dancer, athlete)
Intrapersonal: access to one's own feelings and the ability to discriminate among them and draw upon them to guide behavior (therapist, social worker)
Interpersonal: capacity to discern and respond appropriately to the moods, motivations, and desires of other people (teacher, salesperson)
Spacial: capacity to perceive the visual-spatial world accurately (navigator, sculptor)
Musical: ability to produce and appreciate rhythm, pitch, and timber (composer, violinist)
Logical-Mathematical: sensitivity to and capacity to discern logical or numerical patterns (scientist, mathematician)
Linguistic: sensitivity to the sounds, meanings, and rhythms of words (poet, journalist)

Different learners approach learning tasks in different ways, employing a variety of techniques and mechanisms just to begin the task: to express the related ideas and make sense of them. One learner may need to outline the task and the process, another may immediately delve into the work, while still another may seek assistance. In other words, each learner attempts to construct his or her own understanding and then builds on and revises this construction. A learner's prior knowledge, preferred mode or style of learning, and environmental influences (cultural, home, school,

community) are all factors that contribute to the diversity of how a learner begins, proceeds, and responds as he or she engages in a learning task.

4. Thinking about One's Own Thinking Improves Performance and the Ability to Work Independently

Examining one's own thinking – also called metacognition – is the skill of standing back and observing one's own thought process in order to evaluate and improve it. *Cognition* is the thinking itself, and *metacognition* is thinking about thinking.

Learners' accomplishments are related to the process of doing, as well as completing, their work. Successful learners develop the capacity to examine, refine, and judge their own work before, during, and after performing it. They are able to engage in self-reflection to understand about themselves as learners. They possess metacognitive, self-management skills that include thinking through obstacles, anticipating what comes next, and monitoring progress. These skills help learners take responsibility for monitoring their own growth and development.

One practical model of metacognition has three key steps: preparation, standards, and reflection (adapted from the FourThought Model, Tishman et al. 1990). *Preparation* is the visioning done before beginning a task. Just as good athletes use visioning techniques to prepare themselves for a good performance, so too good learners prepare themselves to study, take a test, or solve a problem by visualizing how they will strategically create their own success.

Good learners develop and maintain an awareness of the *standards* for performance to judge their own progress on a task. This may take the form of questions they ask as they move through the process. Often, the teacher will have standards for the completion of the task. In addition to those, self-managing learners also formulate and apply their own standards as they engage with the work.

Reflection is the action of looking back critically over a performance and evaluating it: What did I do? How did I do it? What did I do well? What was difficult? What might I do differently next time?

Successful learners see themselves as responsible for their own learning, and know that taking responsibility for assessing their work represents an important part of their success. As learners develop their metacognitive skills, they set more demanding standards for their learning and actively strive to meet the standards in their performance of each task.

What do young people think being smart means? Here's how two fourth graders from Belle Sherman Elementary School in Ithaca, New York, responded to a brief questionnaire:

Name: Justin

1. What does it mean to be smart?

   To know a lot and to think before you do anything, because if you think before you do anything, it might make it easier. Use your head a lot and you pay attention.

2. Are people born smart or do you get smarter? How?

   Depends on if they did a lot when they were young. I did a lot of things and went to a lot of places. I've done a lot of adventures. It teaches me how a lot of places look; teaches me how people live in other cities.

3. When do *you* feel smart?

   Sometimes when people get the questions a little wrong or incorrect, I put my hand up and get it right. When somebody asks me a question, and I can get it right. When somebody wants to know something, and I look up at the ceiling (dark spots) and I find the answer; feels like I'm a little person walking on my brain looking for something.

Name: Roxanne

1. What does it mean to be smart?

   Smart or intelligent is being able to solve a problem and to explain your strategy.

2. Are people born smart or do you get smarter? How?

   Some people are born smart, like Wolfgang Amadeus Mozart, but people who aren't born prodigies, can be smarter by asking questions to get answers.

3. When do *you* feel smart?

   When I can pronounce long words, and when others feel smart.

– Belle Sherman Elementary School
Ithaca, NY

5. Individuals' Stages of Development Affect Learning

Young people's needs, perspectives, interests, and energy change as they grow and develop on different levels: physical, emotional, cognitive. These areas of development are not distinct categories but weave together and mutually influence one another. Understanding the implications of students' stages of development for learning is an important part of the knowledge base needed to create learner-centered schools.

Young people's stages of development are connected with their curiosity. How and about what they think, wonder, and ask questions moves from a focus in young children on themselves, to increasingly larger community and world views as they grow. Preschool children's curiosity is proverbial: They ask questions such as, "Where does the sun go at night?" and "Why?" In early school years, children increasingly define themselves using objective or culturally related traits such as ethnic identity or personal tastes. And in middle and later school years, young people are forming lifelong values and skills, and making decisions that can dramatically affect their futures (NCTM 1989).

The National Council of Teachers of Mathematics (1989) stresses the importance of attending to student development when it notes:

> *It is clear that children's intellectual, social, and emotional development should guide the kind of mathematical experiences they should have in light of the overall goals for learning mathematics. The notion of a "developmentally appropriate" curriculum is an important one (16).*

Attention to child development has implications for assessment as well. As the National Association for the Education of Young Children and the National Association of Early Childhood Specialists in State Departments of Education (1991) point out:

> *Overemphasis on standardized test scores has contributed to a curriculum in which next grade expectations of mastery of basic skills are routinely pushed down to the previous grade (Shapeard and Smith 1988). As a result, what used to be taught in first grade is now routinely taught in kindergarten and what used to be taught in kindergarten appears on the entrance test for admittance to school. The trend toward drill and practice on isolated academic skills in kindergarten and first grade has trickled down further to programs for 3- and 4-year-olds. As a result, the early school experiences of many children are marred by unnecessary struggle and failure (22).*

In talking about developmental stages, it is good to remember that, as in everything else, each student is unique and different. Within a general framework, young people will develop differently, at different rhythms, and with different strengths. A wide variety of factors, from heredity to

Many ways can be used to encourage learners of all ages to think about transfer and help them do it consciously. Here is one technique:

Say to students, "You have a spider's web in your brain." They predictably say, "Ick!" Draw a spider's web on the blackboard. "What do real spiders catch in their webs?" The students call out, "Insects, bugs. . . ."

Continue, "And what do you think you catch in the spider web inside your brain?"

They guess, "Ideas, knowledge, experiences. . . ."

"That's right. When we first learn something, it is out here (draw something outside of the web). If we don't do something special to catch the new knowledge in our web, what happens to it?"

"It gets lost. We forget it."

"Right. To catch that new knowledge in the web in our brains so it stays there, we connect it in some way to something that is already in the web. It can be some knowledge that you learned in school, it can be a personal experience, it can be a rhyme that makes sense only to you . . . anything."

Then, practice making connections with something you are working with. Continue to practice this technique all the time, because it can be a difficult skill for some to learn.

environmental, individual, and cultural conditions, affect the characteristics of each young person's process of growth.

6. Although People May Naturally Make Connections as They Learn, They Often Need Help to Transfer Knowledge to Different Contexts

The ability to make connections among areas of knowledge is a very complex skill. Few people automatically look for connections between what they are learning and other aspects of their current knowledge or their life. This is especially so when they are in the throes of learning something new. And even if they do make connections, they may not be aware they are doing so.

Good learners develop the capacity for making connections. Seeing how areas of knowledge relate is key to understanding new information and remembering it. In order for a learner to transfer what is learned to other relevant contexts, transfer must be explicitly addressed. Learners can be helped to make connections, to identify patterns, and to ask themselves questions about the familiarity of new material: "Is this like anything else I've ever seen or done?"

Actual transfer of knowledge is tied more to the strategies the learner has for doing so than to his or her existing knowledge base. Some learners are able to acquire knowledge with little difficulty but lack strategies for using this knowledge and, therefore, are never able to apply (transfer) it to different but connected situations.

There is no single right way to connect new information to prior knowledge, no single correct framework, perspective, or heuristic. Everyone makes connections differently. But, however it happens, it is crucial to making sense of the world, because unconnected knowledge tends to get lost. The best way to begin learning something new is to look for links to previous experiences and knowledge. This is what provides a context of relevance for the new material. When reflecting on a task, asking how this relates or connects to something else is a proven way of maintaining the new knowledge in long-term memory (Perkins and Salomon 1988).

7. A Repertoire of Strategies Enhances Learning

Learning can be viewed as a form of problem solving that involves consciously or unconsciously analyzing a learning task and devising an appropriate strategy to accomplish it. These strategies are the plans that a learner formulates to achieve a goal; embedded within them are the learning tactics or techniques used to support the plan (e.g., self-questioning, imagery, outlines of tasks or ideas, diagrams). How many strategies a learner has at his or her disposal and how sophisticated the strategies are differentiates successful or expert learners from less

successful or novice ones. Whereas a less successful learner employs only simple skills (such as memorizing and recalling facts or following directions) and is not as able to generate alternate processes, a successful learner can solve difficult problems whose answers are not readily apparent. The latter has developed as a strategic thinker who has acquired an extensive repertoire of strategies, knows when to use them, and is able to apply alternate strategies when one doesn't work. Such strategies are not inborn; they are not permanent or fixed; they can and should be taught to all students (see **Figure 7** below). In fact, if students have a beginning set of strategies, and understand how the strategies help them learn, students are more likely to begin designing learning strategies for themselves (Derry 1988/9).

Figure 7: Some Learning Strategies

Memorizing and recalling facts	Generating options
Following directions	Examining assumptions
Comparing and contrasting	Predicting
Making decisions	Determining cause and effect
Imaging	Building maps
Making webs	Constructing metaphors
Framing	Diagraming
Categorizing	Developing matrices
Observing	Listening

Often, students who seem to have short attention spans, giving up on a task when they do not succeed at it quickly, may actually have a problem with their learning strategies. If a student tries something that doesn't work, and truly has no other strategies in his or her repertoire with which to continue trying, he or she will most likely give up. What this student needs is assistance in developing and using an array of strategies, not scolding for lack of persistence.

There are all kinds of strategies. Some are for specific skills, such as predicting and observing, some for complex processes, such as decision making and figuring out what to believe. There are quick strategies for getting unstuck in a critical thinking or creative process, or for checking and evaluating one's own work. And there are also simple strategies or tactics for remembering, such as heuristics and mnemonics.

Some learners are able to generate strategies and activate them with little or no outside help. Others need more coaching and encouragement through such activities as direct teaching and modeling. They may also need experience putting the strategies into practice, observing others using specific strategies, being encouraged to experiment or take alternative routes, or working in groups to build cooperative strategies and then reflecting on what they have done.

8. Certain Dispositions, Attitudes, and Habits of Mind Facilitate Learning

Learners approach tasks with different "habits" or frames of mind. For instance, some learners may perceive a task as a challenge to be conquered, while others may see the same task as too difficult to even begin to tackle. Some learners are willing to take on unfamiliar, complex tasks, while others are only comfortable working at familiar tasks. Certain habits of mind, such as flexibility, open-mindedness, reflection, and empathy, promote effective learning; others, such as rigidity, bias, impulsiveness, and tunnel vision, inhibit it.

In discussing other learning principles, we noted the importance of a repertoire of learning strategies and the ability to reflect on one's own thinking (i.e., metacognition). If skills such as metacognition are the capabilities that good learners develop, then dispositions enable learners to put those skills into operation.

One important habit of mind is considering various points of view. One way to practice it is to set quotas for identifying a certain number of different perspectives. For example, come up with three different points of view about the information in a newspaper article. Or people may "train" themselves to be reflective, another important disposition, by pausing every ten minutes during a task to ask several questions, such as, "How is this going?" and "Do I need to do anything differently?" Eventually, what feels like an artificial imposition of habits becomes more natural as the learner practices them and realizes they pay off.

An essential disposition for students to develop is self-efficacy: the belief that they have some control over their own functioning and over events that affect their lives (Bandura 1992). Successful learners have a high sense of efficacy. They believe that if they try hard and use appropriate learning strategies, they will learn and succeed. They visualize success and persistently employ different strategies or recognize that they need assistance. Less successful learners doubt their efficacy. They focus on failure and respond to roadblocks by thinking they are inadequate or stupid.

Whether young people believe ability is something that can be developed or is something that one has to be born with is also critical to successful learning. Learners who believe they can increase their ability seek out challenges to expand their knowledge and competencies, learn from their mistakes, and judge their achievement according to their personal growth rather than by comparing themselves to others (Bandura 1992).

Like other good habits, dispositions can be identified, taught, and practiced until they become the natural way of thinking and learning. At first, forming good habits of mind feels somewhat artificial, but with consistent practice, they become our primary mode of behavior (Perkins 1986b, 1990).

9. Working with Others of Different Styles and Perspectives Enhances Learning

Many teachers are now using cooperative learning in mixed-ability groups as one strategy in their classrooms. The research on this approach is very persuasive, suggesting that benefits go well beyond providing students with opportunities to learn to work with others. It has also been shown to improve the academic success of students who traditionally do not do well in school, and to improve, or at least not reduce, the academic success of students who regularly do well in school (Slavin 1991).

There is an important aspect of cooperative learning that goes beyond the obvious social benefits and relates directly to what is known about how young people learn. Working with others of different perspectives can engage higher-order cognitive skills. In well-designed cooperative pairs or groups, students learn to explain their work to others, defend their points of view, and try to understand others' points of view. They learn to plan together, often incorporating and negotiating among various learning styles, experience, and knowledge to develop a single solution or product. They learn to use the constructive criticism of their peers and to present their thoughts in different ways to group members who may not understand the ideas the first time. Through these activities, students can practice crucial cognitive skills and attitudes, such as empathy, analysis, flexibility, planning, constructing arguments, inferring, and the clear use of language.

10. Those Who Do the Work Do the Learning

In learning-centered classrooms, students produce their own knowledge from the earliest age. They work as steadily developing analysts, evaluators, writers, scientists, mathematicians, historians, and the like, studying a variety of information and conducting various investigations in order to create knowledge.

The question for teachers and other adults is: How can I organize and set up learning situations and environments that will motivate and enable students to do their own hard work of learning? Then, how can I get out of the way so they can do it? And how can I guide individual work, manage the many people and activities going on, and pass the baton to students so that they can judge the quality of their own work rather than depend on me to do so?

In order to have what students learn actually become knowledge and not just easily forgettable information, it must be meaningful to them – they have to have created it for themselves; they have to have a sense of ownership for what they learn, why they learn it, and how they learn it. Knowledge created in this way involves a lot of activity and self-direction. It takes hard work. Students pursue deep understanding and become self-managing by assisting each other, planning next steps in learning, conducting research, interviewing knowledgeable people outside the school, creating games and materials, negotiating criteria and standards for quality work, and evaluating their own work and that of others.

For students to be able to do that work, they must take over some responsibilities that have traditionally been associated with the teacher's role. The teacher's role, in turn, changes from lecturer, director, question-answerer, guru, and expertise to coach, facilitator, organizer, modeler of reflection, question-asker, and co-learner. In learning-centered classrooms, teachers do not give up their expertise, but instead use it in new ways, sharing from their own careers as learners, problem solvers, and writers.

11. A Resource-Rich Environment Facilitates Learning

Environments that allow learners to engage actively and in many different ways with ideas, people, and things are the most conducive to learning. These environments make it easier for the learner to connect new knowledge to a familiar knowledge base and to share knowledge with others.

When good learners use strategies and reflective techniques, they automatically uncover questions to which they do not have answers or answers that they want to check against more information. Good learners recognize when they need to seek more information and have ideas about where to go for help. They need and use many different kinds of resources to help them acquire knowledge.

A great variety of materials, including books, is crucial if students are to learn by experimenting, by testing out their hypotheses about how the world works. For students to actively construct knowledge, they need to be able to get their hands on the actual things they are trying to learn about, such as water, leaves, bugs, or money, as well as materials that can represent such concepts as fractions, photosynthesis, and democracy. Learning to use a variety of media, human and physical resources, is essential to the work of building knowledge.

12. Developing Shared Understandings about What Constitutes Quality Work Fosters Learning

Learners are more motivated and able to succeed when they are clear about the outcomes they are trying to achieve and what constitutes quality work, that is, the criteria on which they are judged and the standards from which to determine how well they perform. In many classrooms, learning goals and standards have not been clearly defined. Students have to guess what teachers want. Furthermore, what one teacher wants may not count as success in another classroom.

When learners integrate external expectations with their own internal goals, they are more likely to succeed and to view their performance as something they can control. Then they are able to be active participants in setting goals for themselves and next steps in learning – skills that are essential for developing as a self-directed learner.

What It Means to Focus on Learning

With all thy knowledge get understanding.
– engraved over the entrance of a 1930's-era California school

Learning as a Process

Learning is not linear. It involves connections and interactions among webs of information (Prawat 1989). The process individuals use to construct these webs may be similar, but their organization varies according to the cultures, styles, and other attributes of the learners. Learners construct their own understandings by putting words and pictures to "things." People learn and demonstrate learning of the same knowledge in

a variety of ways and to varying degrees. Rather than a process composed of isolated parts, learning is the coordination of many mental processes that converge into a whole.

The process of learning, or of engaging in a learning task, might be thought of as a journey from one place to another – across the Atlantic Ocean, through the forest, and into the plains. It encompasses all the steps of such a journey, from beginning to end: from planning, to packing, to departing, to all the interesting side trips along the way, to arrival. Learning, like a journey, may be undertaken for different purposes – to relax and take in the scenery or to reach an end destination. Learning, as with a journey, will take different routes and will employ different strategies, depending on the desired purpose. The experiences gained along the way can be as numerous and varied as the number of persons embarking on the voyage.

Too often, in the case of a learning journey, reaching the final destination is considered the most important measure of success. Not only that but, all too often, what learners are supposed to know and do along the way has been prespecified to the point that there are no adventures, no surprises, none of the serendipity that makes real-life journeys memorable. It is as if the trip has been reduced to travel brochures.

> *The physicist Murray Gell-Mann once remarked that education in the twentieth century is like being taken to the world's greatest restaurant and being fed the menu. He meant that representations of ideas have replaced the ideas themselves; students are taught superficially about great discoveries instead of being helped to make them for themselves.*
>
> *In the near future, all the representations that human beings have invented will be instantly accessible anywhere in the world on intimate, notebook-size computers. But will we be able to get from the menu to the food? Or will we no longer understand the difference between the two? Worse, will we lose even the ability to read the menu and be satisfied just to recognize that it is one? (Kay 1991)*

Building New Knowledge: An Example

The limited view of learning described above ignores most of what we now know about how people learn or what "arrival" really means. The following example from science learning will illustrate this point:

A group of teachers and parents gather to watch a videotape of fourth-grade students working on science. In the video, the teacher begins a new unit on photosynthesis by asking the students to tell her what they know about plants and how they get their food. She records their ideas on the chalkboard. The students have many interesting notions about plants and food. These ideas represent the students' own attempts to make sense out of a strange process (photosynthesis) in terms and concepts that are meaningful to them, and as such contain many ideas photosynthesis helps the teacher know where to start, and it helps the students to connect their own ideas with the work of the class.

Watching this lesson unfold in the videotape, many of the teachers and parents feel increasingly uncomfortable with what they see. They ask, "When is the teacher going to tell the students the right answer? It's been 20 minutes, and she is still letting them go on talking about wrong ideas. She's even writing them on the board!" When the audience finds out that this class isn't going to get to "right answers" for maybe three weeks, and that the students are going to find the answers for themselves rather than the teacher giving them the right answers, they are horrified. They worry that the students will retain the mistaken notions they "learned" in the first week of the unit, carry those home, and that parents will wonder what's going on in the classroom.

This example illustrates vividly the concerns that emerge from a belief that students are passive "containers" to be filled with correct information, which leads to teaching as telling, and knowing as remembering. This belief flies in the face of what we know about how young people learn, described in the learning principles discussed earlier. The fourth-grade teacher in the videotape knows that almost nothing she tells her students about photosynthesis can change their ideas about how plants get food unless the students have many different opportunities to explore their own questions, and to articulate and challenge the views they already hold about photosynthesis, even though they may not know that particular word.

Through this process, students create knowledge and construct meaning that makes sense to them and that they will believe and retain. If the teacher tells them what their conception of photosynthesis ought to be, has them memorize the facts, and tests them on it, she knows that the students will not acquire a deep understanding of the process of photosynthesis. They will not remember what they were taught, and may revert, even as adults, to the misconceptions they had when they began. This is what Gardner (1991b) refers to as defaulting to "five-year-old understanding."

Learning as Understanding

Many learning theorists view learning as deep understanding and see the purpose of school as teaching understanding (Gardner 1992; Perkins 1986a). Almost every teacher and parent has a common-sense or intuitive notion of what deep understanding in a young person looks like. Picture a

situation in which you perceive a young person to really understand something. What do you see? What is he or she doing? How do you know he or she really understands? Here are some of the responses we have gotten to these questions:

- He is able to demonstrate his learning in a variety of ways.
- She is able to paraphrase what she has learned and say it back to me in different words that make sense to her.
- He looks excited and intensely interested in the matter at hand. There is a glow, an eagerness in his eyes. He takes initiative to learn more, to seek out information.
- She remembers what she learned.
- He poses good questions.
- She applies what she has learned in other situations.

This evidence that understanding is taking place links back to the principles of learning. The learners are creating their own meanings for new information, i.e., constructing their own knowledge. They are having success using various learning strategies, are interested in learning more, and are applying what they've learned to other situations.

Yet, engaging successfully in the process of learning is only half of the charge of the education system. The other half is determining *what* is valuable for young people to learn. What do they need to know to be literate and contributing citizens? The next section addresses this critical question.

Determining What Young People Should Know and Be Able to Do

The task of describing "the educated citizen" of the twenty-first century is not an easy one. It involves understanding the current and future demands that young people will face, and exploring the array of knowledge and skills that could prepare them. It involves surveying the work of many subject matter organizations that have been busy determining what it means to be literate in mathematics, science, the arts, etc. It involves understanding the task itself and determining the most appropriate people to be involved in each part of it. And, most importantly, it involves asking good questions, engaging in active discussions, listening carefully to a variety of perspectives, and building agreement about what will guide the schooling of the community's youth for 13 years of their lives.

In this section, we describe how several communities have developed consensus on the outcomes they want for their young people and provide

references to the national and state efforts that are currently underway. As you consider these, it will be helpful to clarify the task you have taken on. You will note, for example, that nobody uses the same terms, and those they use are ill defined. *Outcomes, standards, goals, frameworks, criteria,* and *benchmarks* are the terms you will read and hear, and you will need to decide which you are after, and how you will know when you've succeeded. Here are some definitions that you may find a good starting point:

- Characteristics of the educated citizen: These are broad descriptions that are relatively easy to agree on, such as a good communicator and appreciator of the arts.

- Broad outcomes: These are still quite general but may begin to relate to certain disciplines or kinds of knowledge, skills, and attitudes, such as ability to write and speak well, fluency in two languages, and mathematical literacy.

- Standards and criteria: These are the core knowledge and skills young people are expected to develop and the evidence needed for judging the level of performance. A standard, for example, may involve the ability to think critically; criteria for judging it may include demonstrating understanding of a given problem or issue, ability to distinguish between fact and opinion, and consideration of consequences.

- Benchmarks: These are the checkpoints at various places in the learning process that tell how the student is progressing in meeting the standards. A standard, for example, may involve understanding the structure of matter; benchmarks for late elementary students may be knowing that materials are made up of parts that are too small to be seen and that a new material made up of two or more other materials may have properties that are different from the original two.

Clearly, the task gets much more specific as you move from characteristics of the educated citizen to benchmarks, and it relies more heavily on the specialized knowledge of teachers and subject matter specialists. Therefore, we recommend that as the task becomes more specific, these professionals take primary responsibility, with the understanding that a wide variety of community members stay involved to review the work for clarity and to ensure that the values and emphasis of earlier stages are preserved.

> *. . . [H]igh school graduation should be a recognition of a student's ability to be reasonably successful in daily life as it is today and as it is likely to change in his/her lifetime. From the set of expectations [we have developed], each person should be able to understand and assess his or her own abilities and their relationship to the capacity for achieving higher or lower chances for success in life. Not all of these competencies must necessarily*

be the responsibility of the educational community alone. They should be the shared responsibility of all of us in the community (Business and Industry Association of New Hampshire 1991).

Standards That Meet the Demands of a Changing Society

The impetus for current discussions of new standards for student success is a response to the cumulative and pervasive changes in contemporary society. People confront these changes every day; they are what Weisbord (1987) labeled "permanent whitewater." The world will never again be (if it ever was) the stable, simple place that nostalgia preserves. These changes affect everyone, transforming the way people live, work, and learn.

Some of the trends in our society (see **Figure 8** on page 35) that we need to pay particular attention to are global interdependence, ever-growing diversity, explosion and turnover in knowledge, and increasing demand for collaborative problem framers and problem solvers. It is important that communities consider global trends as well as trends in their own localities as they frame decisions about student outcomes. [See Hodgkinson (1992) for more about global and other trends.]

ACTIVITY FOUR

Changes In My Community is an activity that the community can use to identify and discuss changes that have occurred locally within a context of global changes. It is described in Appendix A-4.

Currently, there are discussions across the country on how to redefine *literacy* and *the educated citizen*. People tackling the difficult problems of contemporary civilization are finding that the disciplines in which they were trained no longer provide them with sufficient skills, knowledge, and values to solve the problems they are now encountering. Many of the values we grew up with no longer help us survive and flourish in an increasingly interdependent, pluralistic world. Much of the knowledge we used to think essential is now obsolete. Thanks to instant access through computer networks to constantly changing information, much of what we thought of as basic knowledge no longer needs to be kept at hand. New technologies have radically transformed what we need to learn and remember in order to be an educated and productive citizen.

The work of several national organizations should be of interest as you proceed with this effort. First, many subject matter organizations have taken on the task of identifying content standards – what students should know and be able to do – within their disciplines. In addition, the New Standards Project, a consortium of 17 states and 6 large school districts, is a major national effort to take the standards developed by subject matter organizations and design and implement a system of performance standards, authentic assessments, and professional development. Reviewing what has already been done by these groups and following their progress will enrich the community's inquiry into what is best for its young people.

Another important resource – one that should provide a framework for community discussions – is the work each state has done in setting goals, outcomes, and standards for its students. States have approached this task in very different ways and are at various stages in the process. The passage of Goals 2000 Educate America Act (1994) by the United States Congress

Figure 8: Why Change?

Here are some important trends that make change a necessity:

- **Interdependence.** Our country is increasingly interconnected with the world around it, a world of many different cultures, a world where problems are more complex than ever, a world where four out of five individuals are people of color, from countries about which the average American knows virtually nothing (Hodgkinson 1992).

- **Ever-growing diversity.** Our own society – historically a diverse set of peoples – is unstoppably moving toward becoming even more pluralistic, multicultural, multiethnic, and multiracial.

- **Explosion and turnover in knowledge.** Knowledge can no longer be thought of as a straightforward body of facts to be memorized, or even an ever-expanding body of facts – often by the time we can learn even a part of that body of information, the facts that make it up have become obsolete. Our knowledge about learning, for example, has grown exponentially over the last 20 years, upsetting many of the old guiding notions.

- **Increasing demand for collaborative problem framers and problem solvers.** These conditions pose a demand for the children who will become the citizens and leaders of the twenty-first century. They will need to be effective thinkers and reasoners more than ever before. They will need to create and invent. They will need to be able to work with many different kinds of people. If they are to be successful citizens and members of the work force of the next century, our children must graduate from school knowing how to learn continuously, adapting flexibly to new circumstances and to the need for new skills.

- **Shift in the fundamental purpose of schooling from conserving the past to creating the future.** The societal function of schooling in every culture has been to pass on cultural knowledge, to socialize children in the ways of the culture, to perpetuate the culture and its ways of doing things – in short, learning based on remembering and applying what has been critical to the survival of society. In the face of ongoing and ever-accelerating change, maintaining the societal memory has to be balanced by learning based on continually assessing extant knowledge and inventing new approaches.

sets a framework for all federal education support to the states. The design begins with the examination and setting of standards, development of curriculum frameworks to meet the standards, and assessments to measure progress. Each state will develop plans in conjunction with local districts that build on this framework. This material can provide useful information for any community discussion about goals for its youth. (Contact information for all the efforts mentioned is provided in Appendix C.)

To frame its own work, The Regional Laboratory determined these essential outcomes for students:

- skills for learning and communicating, including reading, writing, computing, listening, speaking, technological and scientific literacy, critical thinking and problem solving;
- essential knowledge that will help them understand and operate in a multiracial, multicultural, interdependent world; and
- a sense of efficacy and personal and social responsibility.

– Designing Schools for Enhanced Learning
The Regional Laboratory for Educational Improvement
of the Northeast and Islands

Examples of Several Communities' Inquiries into Learning

There is no one easy way for communities to consider the work of others and no magic to coming to consensus on outcomes. Communities organize themselves in different ways to attack these tasks and take a long time to read, discuss, and debate. Even though communities need not start from scratch in considering outcomes for their young people, neither should they be lulled into passivity by the conclusions and recommendations of others. Each community must be proactive and make sense of this question for itself and create a framework that matches its goals and beliefs.

To portray the diverse ways in which communities are engaging in inquiry, we include some examples of the progress made in several communities: Lancaster, NY; Portsmouth, NH; Toronto, ON; and Cabot, VT.

Getting Started in Lancaster, New York

Lancaster recently began its community inquiry through a districtwide elementary planning group. The group has worked with outside facilitators to explore knowledge about learning and how to create outcomes and is now collecting and studying the work of other groups.

The current framework has five broad exit outcomes:

1. Cognitive Skills: Students will demonstrate mastery in each of the core curricular areas.
2. Social/Affective Skills: Students will demonstrate appropriate personal and social behaviors necessary for participation in a global society.

3. Metacognitive Skills: Students will demonstrate and apply critical-thinking skills.

4. Problem-Solving Skills: Students will solve problems using relevant factual information and effective decision-making strategies.

5. Concepts and Principles: Students will demonstrate respect for self and others.

The first outcome is further defined in six program outcomes: mathematics, language arts, science/health/physical education, media/technology, humanities/arts, and social studies. Each of the other exit outcomes has more specific program outcomes. Standards and benchmarks will be developed for each program outcome across the grades. Then assessment practices will be designed to match the standards.

At every level of their framework, Lancaster has a check for how the outcomes embody the district's already established beliefs and goals.

Agreeing on Student Outcomes in Portsmouth, New Hampshire

Portsmouth began to articulate their student outcomes in early 1992 as part of a larger strategic planning effort. They created a comprehensive and multilayered design strategy using Action Teams and subcommittees for a variety of tasks. The initiative is lead by the Action Team on Student Outcomes, composed of 15 people: 3 classroom teachers, 2 special education teachers, 2 administrators, 2 school board members, 2 community members, a paraprofessional, a curriculum coordinator, a school nurse, and a student.

In the winter and spring of 1992, the Action Team reviewed research on student learning and child development. They carefully examined the outcome frameworks from 5 states after reviewing about 15. As a result of much reading and discussion, struggle, and debate, the Action Team determined an overall goal:

> Students should have the necessary attitudes, skills, and core knowledge that will enable them to become lifelong learners.

The Action Team proceeded to describe in detail what is involved in developing necessary attitudes and skills. The attitudes include self-worth, citizenry, and valued learning. The skills include communication, critical and creative thinking, collaborative learning, and coping. An example of one such attitude outcome is provided in **Figure 9** on page 38.

Figure 9: Example of a Portsmouth Attitude Outcome

Outcome:	**Self-worth**
Criteria (1 of 3):	Develop self-confidence
Standards:	1) Display a willingness to take risks in order to learn and to fulfill personal goals. 2) Set realistic life and career goals. 3) Express needs and ideas. 4) Develop a sense of personal effectiveness.

ACTIVITY FIVE

Becoming a Better Learner is useful for communities to begin their discussion about learning goals for students. It helps people turn their personal experiences with and observations of children into concrete goals for learning. It is included in Appendix A-5.

Nine subcommittees were established to work on arts, computers, foreign language, language arts, mathematics, personal growth, sciences, social/cultural literacy, and technical/career education. All of the committees included teachers, parents, and school board members.

During the summer of 1992, the subcommittees developed philosophy statements and exit outcomes for each core knowledge area. In the fall, this work, along with the work of the Action Team on Student Outcomes, was presented to the entire staff for their input. Throughout the fall and early winter, the Action Team and subcommittees continued to revise their work and meet with the staff for feedback.

Other Action Teams and subcommittees took responsibility for continuing and implementing the work of the groups that identified the student outcomes. In the spring of 1993, subcommittees of teachers and parents at various grade levels began to work from the outcomes, criteria, and standards to establish benchmarks.

Action Teams on Best Practices and Continuous Improvement began planning how to provide information, materials, and support to teachers as they implement the new outcomes. At the same time, the Action Team on Student Outcomes moved on to research and recommend methods of assessment appropriate for the new outcomes. Finally, an Action Team on Overall Organization of the System is poised to plan and oversee systemic changes needed to make the implementation of the new standards possible over the next year.

<u>Establishing Benchmarks in Toronto, Ontario</u>

Toronto developed its benchmarks and levels of performance by observing students actually working, learning, and performing. The benchmarks represent what students actually *can* do rather than what they *should* do, and the students' performance at each level describes *actual* results rather than *expected* results.

The program uses benchmarks extensively – it includes over 100 benchmarks in language arts and math for grades 3, 6, and 8. An example of a benchmark in language arts for grade 8 is in **Figure 10** on page 39.

Figure 10: Example of Toronto Benchmark in Language Arts

Ability to obtain information from pictures and to explain, describe, and evaluate that information.

Key objectives:

- *use oral language to think, learn, and communicate;*
- *read a painting and demonstrate an understanding that effective reading, of whatever type, is a constant search for meaning; and*
- *demonstrate aesthetic appreciation (Larter and Donnelly 1993).*

This benchmark is provided in full detail in **Figure 11** on page 40. Note that it, like all others in the Toronto program, uses a rating system with five levels that reflect the extent to which the student has reached the benchmark.

Toronto's benchmarks are meant to provide information that guides student learning every day:

> *. . . Benchmarks allow teachers, students, and parents to collaborate and remain in control of learning and evaluation. Because Benchmarks can be observed, they demystify the goals of education and illuminate the nature of good performances. Students use them as models of excellent performances. Parents consider them to better understand today's complex menu of educational objectives and to make meaningful decisions about their children's education (Larter and Donnelly 1993, 62).*

Toronto's rather inductive way of establishing benchmarks, by watching what students can do, is being used by other communities, not only to determine benchmarks, but also to determine what constitutes authentic learning and assessment tasks.

<u>Connecting Student Outcomes with Teaching and Assessment in Cabot, Vermont</u>

Cabot has been working on its process for several years and has made progress at all levels – elementary, middle, and secondary. The district has defined outcomes and standards, and has continued on to establish a framework for both curriculum and assessment, complete with information about which books are a priority to study, how disciplines should integrate their content, and how specific assessment methods provide evidence of standards.

Figure 11: Toronto Language Arts and Benchmark for Grade 8

Toronto Language Arts Benchmark for Grade 8

Key Objectives

- Use oral language to think, learn, and communicate
- Read a painting and demonstrate an understanding that effective reading, of whatever type, is a constant search for meaning
- Demonstrate aesthetic appreciation

TWO PAINTINGS
Viewing (Art Book) and Responding Orally

This Benchmark was developed to assess students' ability to obtain information from pictures and to explain, describe, and evaluate that information. Two paintings, "The Fledgling" by E. Lindner and "The Young Canadian" by D.P. Brown, were chosen from the book *High Realism in Canada* by P. Duval.

Students who did well in the activity described and explained the significant features of the paintings and gave reasonable interpretations of them. They expressed their ideas fluently with appropriate language and vocabulary. They drew reasonable conclusions from the paintings and appreciated that their ideas and feelings had value and were worthy of expression.

Before the activity, students were asked questions about paintings and were rated for prior knowledge and experience. The evaluators then showed the first painting and asked the students to describe it as exactly as possible. After responding, the students were asked: (1) What does the painting make you think about? (2) How does it make you feel? (3) Why do you think the artist did the painting this way? The evaluators next showed the second painting to the students and repeated the same series of questions. Finally, both paintings were shown together, and the students were asked to describe their similarities, make up a title for each painting, and discuss why they preferred one painting over the other. Upon completion, students were asked to evaluate the activity in terms of interest in the paintings, enjoyment of the task, and ease of describing each painting.

The Grade 6 Benchmark, L6-2, shows how grade 6 students performed on this same task when evaluated with identical criteria.

Holistic Scoring Criteria Used for Each Painting Individually, Both Paintings, and Overall Response

Level Five 20%
The student describes and explains the significant features of the painting(s) and gives reasonable interpretations. The student expresses opinions about the painting(s) and often links them to personal experiences. The student is able to clarify assumptions and make inferences and can explain them to the evaluator. Views are stated clearly and concisely. The student is articulate and self-confident. Feelings are considered to be valuable and worthy of expression. The student explores ideas with the evaluator using appropriate vocabulary and conversational style. The comparison of the two painting(s) goes beyond the obvious and is often thoughtful and insightful.

Level Four 32%
The student describes several significant features of the painting(s) with some interpretation. Some opinions about the painting(s) are expressed. The student's description is accurate but not figurative. Views are expressed with some fluency, and feelings are briefly stated. The comparison of the two painting(s) is reasonable.

Level Three 39%
The student describes and explains one or two features of the painting(s) with minimal elaboration. Opinions are rarely expressed, and the description may include inaccuracies. The student may be hesitant in stating feelings and may describe only a single similarity between the painting(s).

Level Two 7%
The student identifies and describes a few details. No opinions are expressed. The student has difficulty expressing feelings, making comparisons, and/or articulating ideas.

Level One 2%
The student is unable to respond or gives a very limited response.

Source: Larter, Sylvia and James Donnelly. 1993. "Toronto's Benchmark Program." *Educational Leadership* (50) 5: 59-62. Reprinted with permission of the Association for Supervision and Curriculum Development. Copyright ©1993 by ASCD. All rights reserved.

The effort in Cabot is occurring simultaneously with the statewide initiative to Reinvent Vermont Schools for Very High Performance. This initiative began with a large-scale effort by citizens at all levels to formulate the "Green Mountain Challenge," which promotes the highest-quality educational outcomes for all students – "No exceptions, no excuses." Part of the widely recognized statewide effort has been the identification and development of elements of a Common Core of Learning. These outcomes are being discussed, tailored, adapted, and put into practical terms in each community.

Cabot has organized around 12 broad outcomes, some of which are listed below. Among them, the Cabot High School graduate will be able to:

- appreciate the arts;
- manage himself/herself in the American economic system;
- read, write, speak, and comprehend another language;
- formulate concepts, gather and interpret data, apply problem-solving skills, and reach reasoned conclusions;
- use a variety of current technology; and
- be socially responsible and independent.

Summary

This chapter has sought to provide a starting point for a community's inquiry into learning. We have discussed the 12 learning principles that The Regional Laboratory staff have shaped from research and theory on learning and what they mean for schools. We hope we have provided you with insights into what it means to learn and what the outcomes of learning might be. Once these questions begin to be addressed, there are many people with a vested interest in knowing how students are achieving results. The topic of assessment then takes on importance.

Recommended Resources

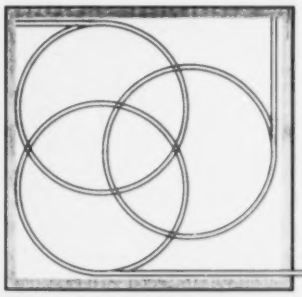
Carini, Patricia. 1982. *The School Lives of Seven Children: A Five-Year Study*. Grand Forks, ND: University of North Dakota Press.

Duckworth, Eleanor. 1987. *The Having of Wonderful Ideas and Other Essays on Teaching and Learning*. New York: Teachers College Press.

Gardner, Howard. 1985. *Frames of Mind: The Theory of Multiple Intelligences*. New York: Basic Books.

Resnick, Lauren B. December 1987. "Learning In School and Out." *Educational Researcher* 16 (9): 13-20.

Wiggins, Grant. November 1989c. "The Futility of Trying to Teach Everything of Importance." *Educational Leadership* 47 (3): 44-48, 57-59.



Chapter Three
Assessing

We must constantly remind ourselves that the ultimate purpose of evaluation is to enable students to evaluate themselves.
— Arthur L. Costa (1989)

Assessment is probably the most complicated and issue-ridden dimension of education that the community will take up in its inquiry process. Yet it is critically important if the principles of learning and the learning outcomes to which community members agreed in earlier stages of the process are to be pursued, reinforced, and protected. Nothing discourages students and teachers more readily than an inappropriate way of assessing something they have worked hard to learn. This chapter seeks to further the discussions, deliberations, and decisions of communities redesigning their schools by helping them address such questions as:

- What is assessment and what purposes should it serve?
- What are principles of effective assessment?
- What are some alternative assessment practices?
- How can good assessment best feed into evaluating and reporting student progress?

The depth of community involvement in the area of assessment varies greatly from community to community. One may delegate all development work to teachers and administrators, preserving for the community only the responsibility of reviewing and commenting on the results at several points in the process. Another, at the other end of the scale, may involve all interested community members in development teams that focus on defined learning outcomes, creating specific standards, criteria, benchmarks, and, finally, assessment strategies. Certainly, the community that develops assessment strategies understands deeply the regular reports of student progress; yet the amount of work involved may deter many from committing to this extent of involvement. As you review this chapter, one question to keep in mind is the depth of involvement your community needs and wants to have in this area, weighing the pros and cons of limited versus full participation, and considering the full range of possibilities. Whatever your decision, the process you use should result in community members feeling comfortable that:

- the assessments yield useful and accurate information about all students that is consistent over time;
- the language used to describe student learning is understood by all; and
- most importantly, that the results of assessment drive teaching and learning, i.e., they guide educators and parents to give students what they need to succeed.

Defining Assessment

One definition of *assess* is "to sit beside." The notion of assessing students' learning by sitting beside them reinforces the belief of many learning theorists that you can learn a lot about students by watching what they do and how they change and grow as they make sense of the world. The observer (be it a teacher or other person) can note information that can then be used to determine how a student is growing and changing; that is, how his or her understanding is different today from what it was yesterday, and what evidence of growth there is.

Assessment has been defined as the "process of collecting and organizing information or data in ways that make it possible for people – teachers, parents, students – to judge or evaluate learning" (Chittenden 1991, 24). Learning cannot actually be seen because the processes that go on in a learner's mind take many forms, are specific to each learner, and are not fully understood even by the learner himself. What can be seen is evidence that learning is taking place. So the act of assessing is the act of gathering evidence of learning. Because there is no direct access to what has been learned, there is not a single way of gathering evidence about that learning. (Later, we examine various ways of collecting evidence.)

ACTIVITY SIX

An activity that is good for getting adults started in imagining what effective assessment is like and appreciating its value is called **Designing a Personal Portfolio.** It can help members of the design team or the larger community to think about assessing by focusing on their own growth as learners. The activity is included in Appendix A-6.

Assessment, or collecting information, therefore takes place before making judgments. By assessing, we seek concrete evidence of learning and organize it so that it can be shared publicly and examined for the clues it gives to what and how a student is learning. This points out the difference between assessment and evaluation. Although they are often thought of as the same, they are not. There must be standards and criteria that serve as a frame of reference for assessment, yet the collected information is not judgment. Evaluation is making judgments about the student's growth (how he or she has changed) and progress (where he or she is in relation to set standards).

Good assessment uses different techniques (is "multimethod") and attempts to offer evidence about a variety of aspects of a learner's performance (is "multitrait") (Anderson et al. 1979), increasingly involves multiple perspectives (teacher, student, parent, etc.), and is done at multiple points in time. Assessment provides indicators of the learning process within a framework of learning standards or outcomes.

The Purposes of Assessment

As this broad discussion of assessment implies, assessment can have a variety of purposes. In a classroom that is centered on learning, the primary purposes are:

As this broad discussion of assessment implies, assessment can have a variety of purposes. In a classroom that is centered on learning, the primary purposes are:

- to gather evidence of what is happening inside students' heads, in order to follow and encourage learning at the rhythm and style most appropriate and stimulating to them;
- to explore and promote the movement of students' learning along lines defined by what we know about learning and what constitutes a successful learner, and what a community wants its children to know and to be able to do as educated citizens and workers in the twenty-first century;
- to help students understand their own learning;
- to help teachers and other educators make their next teaching decision; and
- to offer evidence to the community that the goals they have set for their young people are being attained.

As this list implies, different audiences in a community can have different purposes for assessment (Anthony, Johnson, Mickelson, and Preece 1991):

- Students – when students share in setting standards, those standards are reflected in their personal goals. They feel a sense of ownership of the standards and seek answers about how well they are doing. For them, self-evaluation is a way to find these answers. As students get to evaluate and record evidence of their own progress and personal growth, self-evaluation becomes a vital part of an assessment program.
- Teachers – teachers are concerned with how students are achieving goals within the classroom so that they can plan appropriate learning activities and teaching strategies. They ask questions about how well each student is doing, what evidence of growth there is, and how well the program is succeeding. To assess student progress, teachers must gather information on each student and his or her learning, and evaluate the movement and growth being made.
- Parents – parents are partners in their child's educational process and are a rich source of information about their own children. They want to know how their children are doing and how they can support them

at home. They can often explain how behavior that a teacher sees in the classroom connects to the rest of a child's daily life experience.

- Administrators – administrators are concerned with how successful the system is as a whole. To learn about this, they need to analyze the instructional program. To answer their question, curricular goals have to be clearly articulated and system-wide information about them needs to be gathered. Only then is it possible to draw conclusions about progress toward reaching those goals.

- The Community – as a whole, the members of a community want to know how successfully students are meeting the learning goals they have formulated together.

In the process of assessment, each of these groups – students, teachers, parents, administrators, and community members – engages in searching and questioning. As a variety of people ask questions about how a student learns, a portrait of understanding is created. Each member of the school and the community contributes to a fuller picture of a student's learning by weaving together their perspectives as a cornerstone of effective assessment practice.

Principles of Effective Assessment

Our interest in this book is to talk about "alternative" assessment, that is, assessment that is in contrast to conventional or traditional testing. **Figure 12** on page 47 depicts the differences between the kinds of assessment that nurture learning and those that are more traditional. The ideal comprehensive assessment is one that combines the traditional testing that is often mandated by state and district standards, teacher observations, and authentic assessments. Taken together, these provide a more complete picture of a learner's progress.

Valid, fair and equitable, appropriate, and useful approaches to assessment need to be developed based on how people learn, what the community wants young people to know and be able to do, and respect for young people. The following principles, founded on current assessment theory, are intended to guide a community's discussion and development of its assessment practices:

1. The more students help design assessments and assess their own learning, the more they will understand assessment procedures, learn from assessment activities, and internalize high standards.

2. Assessment should be authentic, public, and performance-based, involving real learning and practice. It should occur in places where students can perform confidently and realistically.

Figure 12: Characteristics of Traditional and Nontraditional Assessment

Traditional Assessment	Nontraditional Assessment
• typically are norm-referenced or criterion-referenced paper-pencil tests consisting of objective-type multiple-choice and short-answer items	• typically are assessment tasks, which may include one or more of a variety of response formats (e.g., written, oral, performance, interview, logs, portfolio, etc.)
• tests for acquisition of in-school-type learning; assesses real-world competencies and skills indirectly	• assesses ability for solving real-life challenges and situations; assesses real-world competency and skills directly
• tests learner's recognition and recall skills; places student in passive, reactive role	• tests learners' knowledge creation and problem-solving skills; emphasizes the active participation of the student
• may contain many items covering a wide range of content and skill areas; measures breadth of learning	• contains fewer items which may require the application of a wide range of knowledge bases and multiple skill levels; measures depth of learning
• has one correct answer; requires little, if any, judgment on part of scorer	• tends to provide for multiple responses or multiple paths to a single answer; requires more subjective evaluation by the scorer
• is completed individually and normally without the aid of peers or resource materials	• may involve the use of a variety of instructional aids and may involve cooperative learning
• what is to be tested and correct answers are kept secret and secure until time of the test	• what is to be assessed and how it is to be assessed is generally known by the student prior to the assessment
• is easily administered and scored for large groups; efficient to administer; more cost effective	• requires more time than typical tests and is not easily administered to large groups; less efficient; more costly
• validity and reliability of items are established using traditional psychometric techniques	• validity and reliability of assessment task is difficult to define and measure
• is designed to sort and rank students by test scores	• is designed to recognize quality work of all students
• provides the students one opportunity to demonstrate knowledge and skill acquisition; provides a snapshot of the learner	• generally provides the student multiple opportunities for practice and performance; provides a motion picture of the learner

Source: Reprinted with permission from David L. Silvernail, University of Southern Maine, 1992.

3. Assessment should capture students' mastery and use of essential knowledge, as well as their ability to use what they know to build new knowledge. However, the focus of early assessment may be on the progress and effort students are making and then, over time, may place more emphasis on mastery. This shift in criteria must be clear both to students and to others with an interest in assessment results.

4. Assessment should allow for and encourage student choice. For example, different activities may be designed with different degrees of difficulty; different approaches may be designed to assess the same knowledge; or several assessment opportunities may be provided over time.

5. Assessment should occur over time so that a cumulative record displays a variety of products, not just final or best works.

6. Assessment should clearly define both the task and the characteristics of a successful outcome so that students know what they are aiming for, as well as what they have achieved.

7. Individual classroom grades should not appear by themselves. They should reflect progress on clear benchmarks toward graduation requirements, from elementary school, middle school, and high school, where appropriate. School transcripts should explain how the standards set for their students compare to standards in colleges and/or workplaces, on similar tasks or in similar content areas.

8. Assessment results reported outside the school should be accompanied by other relevant information about the community (type of community, socioeconomic status), resources (per pupil expenditures, physical facilities, staffing), programs and processes (curriculum, instructional methods, class size, grouping patterns, school organization), and outcomes, both at the individual and organizational level (student performance, dropout rates, employment, further education).

The following vignette captures many of the principles of effective assessment listed in the text, as well as the contrast between traditional and new perspectives on assessment.

"It was time for change," thought Marcia Lopez. For 10 years, she had been teaching her chemistry and marine biology classes in traditional fashion. She had emphasized the teaching of basic facts of the science; she often had her chemistry classes practice appropriate algorithms to

(continued)

obtain answers to exercises from the textbook. Ms. Lopez had believed such an approach was needed to prepare students for college science courses. She had resisted change, believing that she was an effective teacher. After all, that's what she had been told by colleagues, school administrators, and students – students who subsequently had done well in college.

Then Ms. Lopez read about the constructivist approach and saw it demonstrated. She was impressed. She decided to switch her approach from teaching facts to teaching science concepts and processes. She oriented her marine science class toward work on projects. Instead of attending lectures, students focused on doing investigations. Soon, they were conducting field investigations with local relevance. Students constructed mini-ecosystems, similar to such natural ecosystems as salt marshes, oceanic zones, and estuaries, and completed long-term projects involving aqua-culture and hydroponics.

Because grades were required, Ms. Lopez needed to conduct formal assessments. She believed that traditional tests would be inappropriate for her marine science class. She preferred oral assessments, noting that these gave her "the freedom to probe kids, yet still figure out who doesn't know" concepts and material.

Ms. Lopez adamantly insisted that she had not changed her approach to teaching. She claimed that she had always believed that the investigation-driven approach was appropriate in science courses for non-science majors. These students did not require the same foundation of systematically organized science knowledge as did prospective science majors preparing for university science. However, because of her positive experiences with the marine science class, Ms. Lopez also decided to change her approach to chemistry teaching to emphasize investigations and project work. After briefly introducing her classes to some basic facts about chemistry, students tackled investigations. Groups of students undertook projects, after negotiating about the focus with one another and her. Each group undertook its own investigations and tended to work independently of other groups.

Ms. Lopez was comfortable with her new approach. She fit smoothly into a new set of roles, including assessing student learning. Because students were learning science in different contexts, she faced the challenge of finding out what they were learning. Her first idea was to assess learning through personal interviews. This ushered in a student-centered approach to learning. Students had control of their own learning, and Ms. Lopez had time to interact with students in a leisurely manner.

(continued)

Ms. Lopez decided to assess five students per class period. She gave the students an oral examination in which she questioned individuals on any aspect of their project. She recorded whether each student's responses to questions were adequate. She considered this process fair because she asked each student a similar set of questions. Furthermore, she believed that each student should know about all aspects of the group's project. Ms. Lopez also required students to construct a concept map as part of their project. She asked them to discuss the map with her and answer any questions she might have.

Ms. Lopez's students developed a preference for oral examinations. Because some had communication problems when required to write answers, they enjoyed the opportunity to be graded on oral responses.

She used other forms of assessment, too. Initially, she required students to make daily entries in a data book. Before long, however, many students found daily record-keeping burdensome. Ms. Lopez gave them the option of preparing weekly summaries. Some students did so, while others continued with daily summaries. She collected the data books each week and assigned 25 points to those that were complete. Students also were required to submit research papers. After Ms. Lopez had commented on the papers, students submitted two revised versions. Each revision was worth 50 points; the final report was assigned 250 points. Ms. Lopez set high standards for the final report: it was to be "like other scientific papers, with procedures written clearly so they could be repeated" and, if possible, achieve publication quality.

Ms. Lopez graded class participation randomly. When she had a spare 5 or 10 minutes, she surveyed the class and entered a 5 or 0 for each student. She used participation assessment to motivate students when she felt they were not working hard enough. If students' progress appeared to be slow, she would grade the class for participation every day for a week to "get them motivated to engage in the project."

Ms. Lopez got some helpful feedback when she discussed her teaching and assessment methods with colleagues. They suggested that she reconsider her method of grading students for class participation. They also mentioned that she might have to reconsider her emphasis on interviews and oral responses, which might have to change if she were presented with a different cultural mix of students. They also suggested that she might start keeping records of her systematic observations of students as they proceeded through their investigations and incorporate her observational judgments into the students' grades as well. This could give her another useful source of data.

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Characteristics of Effective Assessment Practice

In order for teachers, students, schools, and communities to use assessments as evidence, and to reflect upon and make decisions based on that evidence, the connections among learning, gathering evidence of learning, and interpreting that evidence have to make sense. And they have to make sense not just in an individual instance, but over time and across teachers, learners, and schools. Along with expectations of excellence, there must be assurances of equity.

Traditionally, the criteria for judging good assessments have focused on *validity* and *reliability*. Validity (or directness) is the extent to which the assessment task directly resembles the learning that it aims to assess. Reliability is how consistently the criteria for judging performance are applied across judges and over time. These two criteria in an expanded form apply to authentic assessment. Together these three characteristics – authenticity, reliability, and validity – form the core of effective assessment practice. Validity and reliability continue to be important criteria of good assessments, yet as the types and purposes of assessment expand, so too should the criteria used to judge them.

Authentic

As noted in the last section, good assessment practices are authentic. They acknowledge the student's real life and how they learn, and take place in real-world situations. They provide information that can increase student learning. They are not student- or teacher-proof and require judgment by the teacher or other judge. Because authentic assessment depends so much on the teacher, uses many methods, and occurs over time, the community has to understand clearly both the processes (assessment) and the judgments (evaluation).

This contrasts with traditional tests that help little in understanding the learner and the learning process. Tests are aimed at producing a score and have no use without the score. They are both student- and teacher-proof, reflecting no individuality of the test taker and requiring no judgment on the part of the test giver.

Validity

Validity has often been so narrowly construed that many assessment tasks appear, on their face, to be directly related to the learning being assessed, but may provide only partial indicators of the learner's actual ability. For example, a test trying to assess students' ability to use a thermometer may show a picture of a thermometer and ask students to select the correct temperature reading from a list of numbers. That is very different (and less valid) than giving a student a thermometer and a glass of water and asking what the temperature of the water is.

A broader view of validity is necessary to match the complexity of authentic assessments. Greater validity does not come from simply *using* performance assessment. Some elements to consider include:

- Transparency – the degree to which the student can see the connection between the assessment task and his or her own learning. Does the task seem meaningful to the student?

- Consequence – the degree to which the assessment influences how much time is spent on what and how people think about educational goals. Does the assessment contribute to the design of educational experiences that promote more learning?

- Equity – the extent to which the design provides all students equal opportunity to perform well and the assurance that the scoring is not shaped by individual judges' perceptions or biases. Do some students, by virtue of their learning styles, language, culture, etc., perform better or worse than others?

- Generalizability – the extent to which conclusions from assessment tasks provide information about broader skills, knowledge, and ability.

- Cognitive complexity – the extent to which assessment tasks emphasize higher-order thinking processes, such as problem solving, reasoning, and metacognition.

- Content quality and coverage – the extent to which the assessment tasks are worthy of the students' time and effort and represent a broad scope of content. Because students spend more time on fewer tasks in performance-based assessment, it is particularly important that those tasks are high quality and incorporate a variety of content.

- Cost and efficiency – how feasible the assessment practice is in terms of time and money. This is an important issue to wrestle with since authentic assessment tends to be much more labor-intensive than standardized tests.

These criteria pose difficult questions that communities need to read about and discuss. Many of them are explored by Linn and his associates (1991) in an article listed at the end of this chapter in the section titled Recommended Resources.

Reliability

Reliability, as well as efficiency and the ability to compare results, have been overemphasized. Because direct assessment requires subjective judgment, reliability deserves careful attention. Take, for example, the judging of a figure skating competition. A figure skating competition is a performance, a demonstration of mastery in the art and technique of figure skating. The judges have a set of primary traits in which they judge the

One strategy used by teachers to evaluate evidence consistently and reliably is blind reading. In blind reading and testing practices, teachers collaborate to assess the work of each others' students, such as written essays. Training in blind reading allows groups of teachers and others to develop the ability to evaluate students' work consistently across time and judges. Here again, we see the process of collectively developing and reinforcing standards. For blind reading to be possible, there must be agreements on the kind of learning that the student's work is supposed to demonstrate, on the traits that will be used to describe that learning, on the levels of performance that the work represents and their relative importance, and on the consequences resulting from the assessment. These agreements can be reached beforehand but can only be perfected in their application through the group's extended and ongoing practice.

skaters' competence. Together those traits represent a common agreement in the field about the standards for excellence in figure skating.

People agree that a triple axel is performed in a certain way. Success involves completing a particular combination of movements (such as starting the jump on the correct foot and part of the skate blade), and avoiding others (such as touching the ice with the hand upon landing). These traits or criteria provide a framework for assessment, but each judge must make a subjective evaluation about the quality of the performance with regard to each trait and then determine a single score. This makes their judgment subjective, even when the traits are agreed upon.

Compare that to a multiple-choice test of mathematics, where the matter of answering the questions correctly is objectively clear; that is, the design of the test dictates the correct responses. What is less clear is whether the test taker's choice of answers has anything at all to do with mathematical reasoning and his or her competence in it. The multiple-choice test is more "indirect" and more "objective." We would say, then, that figure skating assessment is more valid but less reliable across time and judges, whereas the multiple-choice test is less valid but more reliable across time and scorers.

Some of the ways that teachers are trying to ensure that they judge students' work using consistent criteria over time are:

- through staff development opportunities where they learn about and create common criteria and benchmarks;
- through regular discussions among colleagues to check perceptions of student progress;
- by moving up through the grades with the same group of students;
- by passing student records and work along through the grades, in the form of portfolios or other collections; and
- by using consistent assessment methods.

Gathering Evidence of Learning

We have already pointed out that assessment data are not the same thing as what is in the mind of the learner. Assessments can only provide clues to or evidence of learning. Part of the community dialogue can focus on what constitutes evidence of learning. Having a common understanding of what and how evidence will be used to portray student growth and overall program effectiveness is a pivotal connection between the community's hopes for its young and the realization of those goals.

Some communities choose actually to participate in gathering assessment data; at minimum, everyone needs to understand how the data tell a story about students' learning. In the same way that students have traditionally shown their tests to parents and in some cases had to get their parents' signature, so too should parents see student logs, portfolios, and performances and perhaps be invited to respond and add to the teacher's and student's comments. They need to know what they are looking at so they can best contribute to their child's learning.

There is an old Middle Eastern Sufi story about a man who has lost his keys. He is down on his hands and knees in the street at night looking for them, when another man happens by and asks what is wrong. "I've lost my keys" is the man's answer, to which the second asks, "Where did you lose them?" The first replies, "Over there in the dark." Exasperated, the second man cries out, "Then why are you looking for them here under the street light?" "Because it is lighter here, and easier to see," explains the first man, as he resumes looking.

Designing good assessments requires deciding what to look for and why, where and when to look, how to look, and what to do with the information gathered. The aim of assessment is to produce useful information about learning, in all its complexity and variety. The purpose of this information is to provide students, teachers, schools, and the community with evidence that can serve as the basis for reflection, decisions, and judgments about learning and teaching.

To gather good evidence, to get good clues, one has to have a general idea of where to look. Often, certain kinds of methods are used because they are easier – that is, more efficient, convenient to use, familiar, and predictable – even though the evidence they provide bears little resemblance to the learning the community wants to gather evidence about. Traditional tests fall into this category. They are much easier to administer and score than authentic assessment approaches, and surely the percentile score or letter grade is familiar to all. Yet do the scores really tell us about the student's learning and progress over time toward outcomes the community believes are important to success in life?

Some ways of collecting evidence provide more evidence than others; some combinations are better than other combinations. Here is an example. Asking a student how she solved a particular problem tells us how she thinks she solved it, in retrospect. Maybe if we ask the right questions, we can learn how she felt about the process. This provides us with her reconstruction of the process and may be a good indicator of how she thinks about her thinking and problem solving; it is not necessarily accurate. If a teacher had observed her as she solved the problem, the teacher might obtain some different evidence to compare with the student's self-report. If the student kept a problem-solving journal, that would give the teacher additional evidence; and if she made notes or drawings as she worked through the problem, the teacher would have yet another perspective.

If teachers, students, and others in the community collect information in these ways over time, the result is the collection of enough evidence to be able to make some judgments about student learning. In designing assessments, the community must aim for good combinations of good ways of collecting evidence about learning. Then, in good combinations, teachers, students, parents, administrators, and the community as a whole can make valid connections and draw sound conclusions, which will drive valid judgments and decisions.

As soon as students in Mr. Last's fourth-grade classroom began their study of crayfish, they knew that this unit was going to be different. The day the crayfish arrived, they put them in a child-sized play pool, about four feet in diameter, with rocks on the bottom for the crayfish to hide and hunt in, covered in about two inches of water. In pairs, children picked a crayfish and together the class devised a system of fingernail polish to mark which crayfish was which. They made a chart to go on the wall with symbols for each crayfish, its team members' names, and the name they had chosen for their crayfish. Then the teacher asked the children to write a letter to their crayfish, telling it exactly how they would care for it during its stay in their classroom.

As the days passed, the children learned how to gather and record descriptive data. They carefully observed their crayfish, noting its habits and activities. They gathered other information, including its length, weight, and the speed with which their crayfish moved. Each night the children brought home tables of data to translate into graphs and charts, which allowed them to do comparative analyses of their different crayfish. Next they learned about controlled experiments. They explored whether and what types of food the crayfish preferred. The children recorded the data in their science journals. They drew pictures of their crayfish and wrote poems about them.

Toward the end of this unit, the children began looking forward to the traditional ending of the crayfish's time in their classroom, which they had heard about from older brothers and sisters. They would go to the nearby river and release the crayfish into their natural environment. This time the ritual included a slight twist: Each team would build a biodegradable raft for their crayfish to float away on. And they would write a song to send their friends off safely, which also would help them feel better about saying good-bye to animals they had grown close to over the weeks.

All through the unit, these students had been producing evidence of learning. They did so through their involvement in discussions about the crayfish, the writing in their science journals, their data sheets and charts, and the pictures they had drawn of their crayfish. Evidence of learning was found in the poems and songs that they wrote for and about their crayfish, and in the letter they wrote at the beginning of the unit (which, by the way, also demonstrated empathy and concern for the well-being of the crayfish). Now, how would one assess their final understanding of this unit and do so in a way that was itself a meaningful learning experience for the children?

Mr. Last thought of a novel assessment activity. He contacted a local radio station and found someone who produced shows for children. They arranged for his class to produce their own radio show about the crayfish unit. The show included interviews through which the students explored what they had learned, a group song to introduce and close the show (which they also wrote), examples of the data they had collected, and a

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tape of the release ritual by the river, which included an enactment of two crayfish sharing their experiences of the past few weeks. Aired a week later, the show demonstrated to the community what the children had learned and more. As a way of sharing evidence of the children's successful performance, the teacher made tapes of the show available to all parents.

Addendum: A few weeks after the unit ended, one of the children decided that he wanted to have a crayfish costume for Halloween. He found himself in a debate with his father over how many legs to have in the costume. Because of all the observations the child had made as a part of the unit, and the drawing records he had kept, the boy was able to prove that he was correct.

– Rick Last, Teacher
Fort River School
Amherst, MA

Alternative Methods for Assessment

The community discussions about what assessment is and what counts as evidence of learning lead to the next step of exploring specific authentic assessment methods or ways of gathering evidence. There are many ways of gathering evidence. They include:

- observation;
- questioning or interviewing students;
- portfolios and other collections;
- performances; and
- student self-assessments such as journals, checklists, and rubrics.

Some of the above methods of collecting evidence are discussed in this chapter. We describe each, provide an image of what each looks like in a learning-centered classroom, and offer some ideas for practice in text boxes. Since we do not describe in detail how to design or use these assessments, we offer resources that may be helpful at the end of the chapter.

Keep this practical consideration in mind as you read: Teachers cannot gather every type of evidence of every kind of learning about every student every day. Nobody can. As mentioned earlier, it is important to find assessment methods that match the learning that is being assessed and to use multiple methods over time. Further, teaching and learning in the

classroom do not have to stop for assessment, as in the more traditional system, where "teach then test" is the norm. Assessments that teachers find most useful are often those done while their students engage in a regular learning activity; for example, they assess students' collaboration skills while students are working together on a mathematics problem. Although some assessments, especially those done across classrooms, constitute special activities, the more embedded the assessment is in the life of the classroom, and the more indistinguishable it is from other learning activities, the less time is an issue. Some teachers use a sampling matrix or grid, to help organize how they collect data for each student (see Appendix B-1).

Observation

Observation is the assessment method most easily embedded in the ongoing life of the classroom. In classrooms where students are actively involved in their own work, observing is both a teaching and assessment strategy. There is time to observe because, as one teacher put it, "If you set up the expectation that learning is the kids' work, then you can leave them alone to do it and observe them doing it." Classrooms that are full of opportunities for students to engage in complex tasks in active ways, individually and in various groups, provide more opportunities for teachers to observe. In such an environment, the teacher or other observer can be seen moving slowly from place to place, observing here, asking a question there, pausing to get a sense of the whole classroom, taking a brief note, and moving on. Observers can see individual students at work, step back and see a small group, step back farther and see the whole class. Observation provides evidence of learning that can help teachers and other staff decide where best to focus their energy. That focus makes some teachers feel that their job is easier overall and certainly more effective.

We start the discussion of assessment methods with observing because it is closest to the idea of assessing as "sitting beside." Observing seems so benign that it may be easy to miss the power of this assessment method. Observing students is a good way to get below the surface of the learning-centered classroom, to truly understand what is going on there, and to collect evidence of the student's learning process. It is an especially useful method for understanding and assessing a student's language abilities, particularly those who are bilingual (Figueroa 1990b).

Observation can take many forms. Some observing is open-ended, where the observer watches without predetermined questions, asking only, "What is going on here?" In other cases, observing is more structured, answering more specific questions, such as, "How does he make sense of how a chrysalis changes into a butterfly?" Some generic questions that may be helpful are, "I wonder what this means to her? How is she making sense out of what she is doing now? What do I need to look for in order to better understand her understanding?"

Mr. Nguyen's seventh-grade life science class has spent the past month studying the skeletal system, visiting the museum and zoo, and comparing the different forms and functions of bones in different animals. The next week, he decided to introduce an activity in which the students would study owl pellets. He would use the activity to culminate his students' investigation of bones and to help assess his students' learning. He was interested in not only the science concepts and related facts they had learned (such as what the size and shape of bones can say about the animal), but also how they used their knowledge to investigate new questions and how well they worked together.

Mr. Nguyen preceded the activity with an explanation of how owls eat their prey, digest the soft body parts, and then regurgitate undigested pellets consisting of bones, skin, and feathers or fur. He challenged his students with a simple question: What do owls eat?

Mr. Nguyen began the information-gathering phase of the activity. He distributed owl pellets, which he had obtained from a school science supply house, to groups of two students. The students carefully pulled the pellets apart, revealing tiny bones inside. Using an identification sheet, the students sorted the bones, matched them, and speculated as to which animal the bones had come from. As the students worked, Mr. Nguyen moved from station to station with his stack of index cards and noted the way each pair of students went about their work. He looked for ways the students classified the bones and evaluated how the students worked together. He listened as they discussed approaches to answering the question he had set for them.

Once the students had sorted and grouped the bones, Mr. Nguyen asked the students to fasten them to a sheet of black paper, laid out so that the skeleton of each animal was reconstructed as accurately as possible in two dimensions. As the students worked, he gained insight into how the students interpreted what they found inside the pellets. He looked to see whether they identified patterns, noted the size and scale of what they had found, and transferred their knowledge of the skeletons of larger mammals to a new set of mammals. He watched for when they ruled out hunches refuted or not supported by evidence.

When at last the students had finished, he asked for each pair to decide on their answer to his question. What do owls eat? On one level, he expected such answers as "moles" and "field mice." But, as each group showed their data to the class, he began to look for more complex scientific thinking. Were the students demanding justification for inferences? Had they questioned whether the data were sufficient to make generalizations? Did the students ask new questions?

As his students discussed each presentation, he took notes. Later, he added these records to the skeleton charts and written summaries of the owl's place in the food chain that the students had completed earlier. He

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also had their answers to the previous weeks questions on individual bones. He now had a rich supply of data to assess his teaching and his students' learning.

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Students can be observed doing a lot of different things in different places by different people – talking, reading alone or to others, writing, acting, making things, explaining things to others, listening, sitting still, or even doing nothing at all. They can be observed in the classroom, playground, lunchroom, home, and community by parents, teachers, support staff, and diagnosticians. Students behave differently in various situations and need to be understood as individuals and as members of various groups.

Many teachers find that checklists are helpful in conducting rather brief, systematic observations. The observer records what students do with respect to predetermined behaviors, skills, attitudes, or indicators of growth. Some sample checklists are included in Appendix B-3. Seeing what others have done may be a good place to start, but ultimately other people's checklists are rarely as valuable as those developed by the people who will use them (Anthony, Johnson, Mickelson, and Preece 1991; Tierney et al. 1991).

Acknowledging observation as a crucial component in learning-centered environments means a change in how teachers and others perceive teachers' work. Administrators and community members must support and even participate with teachers in their role as observers of learners. Equally important, teachers must support each other and participate in activities where they learn and practice how to use observation as a formal assessment strategy. (A detailed guide to observation is included in Appendix B-2.)

Questioning or Interviewing Students

The more questions teachers ask students, the more teachers come to know how students build new or more complicated understandings. As one teacher notes, "You've got to keep them talking. That's one really good way to get to know what they're learning."

In a creative, learning-centered classroom, an interviewer gathers evidence of learning by asking students questions to which there are no known or single answers. For example, "How did you come up with that idea?" "Why did you decide to approach the project in that way?" "What do you think are the strengths and weaknesses of your work?" The interviewer is seeking information that will help him or her understand how the student's

With the following notes from a Cambridge (MA) public school teacher, she describes how she conducts student interviews; the information she gathers helps her design the most appropriate learning activities, settings, and partners for her children.

T: "Which activity do you like to do in the classroom?"
S: "Reading, writing, drawing, games."
T: "Which activities do you find difficult?"
S: "It is difficult for me to sit in group.
Oh, he is right . . . I see in my notes he has been taking a long time to come to groups . . . he prefers to sit in a chair or in a standing position . . . he does not like to sit at the rug.
T: "If you have the opportunity to choose any activity in your classroom, which one do you chose?"
S: "Toys and puzzles."
T: "Which part of the school do you like?"
S: "Singing, reading, and playing with my friends."
T: "Is there something in the classroom that bothers you?"
S: "Painting. . . I do not like it . . . painting . . . and I do not like housekeeping."
T: "When you are mad what do you do?"
S: "When I am angry. . . . bammm. I have to move." (Stephanakis 1992)

mind is working. As with the notes that result from observation, information from interviews provides clues about the paths that students are following over time. A teacher who has a firm understanding of how students think is better able to help them through the tougher places, the places where they get stuck.

In the process of being interviewed, students begin to examine their own thinking, and the interview becomes a learning experience. As students try to answer questions about how they are thinking, they become clearer about the things that they are trying to make sense out of. They also begin to see contradictions and conflicts in their ideas. By seeing those contradictions, their hard-won beliefs are challenged and a place opens up for new learning to occur. Careful questioning can help students move through these areas of uncertainty toward new learning.

Interviews can be used to assess the knowledge and skills the community wants its students to develop. They can also help assess a student's self-perceptions, feelings, and coping skills.

Asking good questions is a complex and difficult skill. It requires practice to be able to formulate good questions and know when to ask them. As with other forms of assessment, teachers and others who want to use interviewing as a form of assessment will benefit from opportunities to learn the skills involved, collaboratively building a repertoire of assessment strategies for valued student learning outcomes.

Information about students and their learning can also be gathered through interviews with people other than students, especially from their parents and other family members. Cultural, family, and linguistic information, such as developmental and educational history, health, family issues, household data, language-use patterns, coping, and support systems can all be useful in creating a picture of the student as a whole. Family interviews are especially useful within multicultural communities because they can contribute to understanding characteristics of the student that may be unfamiliar to school personnel.

I've been experimenting with interviews to assess student writing. Periodically I ask students to talk with me about their writing to date. I ask questions such as:

- Which writing is your favorite? Why?
- Is it your best? Why or why not?
- If you were to rewrite it, what might you do differently?
- What are you going to write about next?

Here are some examples of what they tell me:

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Kayla wrote three stories – My Brother and Me, Me and Anthony and Other Rhymes, and Princess. Kayla responds:

"My favorite book is My Brother and Me because it is about me and someone in my family. It is better than my other books because I worked very hard on the pictures and the writing I did. I think next I'm going to make a book about me and the things I can do by myself."

Sou wrote two stories – The Scary Haunted House and The Legend of the Colorful Hills (which was inspired by reading and activities around The Legend of the Indian Paint Brush). Sou responds:

"I haven't finished it yet, but The Legend of the Colorful Hills is going to be my favorite because it is going to be a very nice story with lots of colors in it. Do you know why? Because it is called The Legend of the Colorful Hills. I've decided on this page, but I think I'm going to write a little more on this page. I like sound spelling because I can read to my brother Minh and Robert, too."

Zack wrote one story – Summer Vacation, a Book about Zack. During our first conference, he said:

"It is my best because I did good writing on it, because it looks nice to me. After rereading it, I thought it was excellent. I was still going to put 'the end' and then us going in the house."

Later we conferenced around Zack's story – Plumbing:

"It is my favorite and best because it is my second book. I did better than the last one. I did better straight lines and curves. I guess that's it."

Talking about their stories allows students to reflect and assess their own work. They see progress from where they started, see what they need to work on, and set goals around their areas of need. I use audiotapes of my talks with them, as well as journals they keep and records of my observations to communicate with other teachers and with parents about how the students are doing.

– Kinni Kancer, Primary Grade Teacher
Sunapee Central Elementary School
Sunapee, NH

Portfolios and Other Collections

A portfolio is an ever-expanding collection of a student's work that is regularly reviewed by teacher, student, and parents to discuss such questions as where the student was, is, and will be; what he or she has accomplished; and what needs work with respect to the standards and benchmarks the community has agreed upon. Almost all portfolios begin as collections of student work but become more than that over time. While a collection is just that – materials that are being saved – when it begins to be used to tell a story of the student's growth, then it becomes a

portfolio. In some ways, collections are like assessment, whereas portfolios are more like evaluation. The thinking and discussions that result from examining a portfolio are what makes it a valuable assessment tool; discussions of a portfolio are documented, and any conclusions or decisions that result become part of the portfolio as well.

One of the goals in learning-centered classrooms is to get students to develop products that reflect their growing knowledge and skills. Both works-in-progress and finished products can become part of a collection or portfolio. These offer the community clues about how students are solving the problems that confront them, how they are trying to make sense of things, what questions they are pursuing, and how they are making choices and decisions about how to proceed.

If the portfolio is supposed to contain evidence of learning, how is it decided what goes into it? There is a great deal of variation in how teachers and schools define and use portfolios. A good portfolio may have some or all of the following pieces in it:

- items the student wants to put in – either works-in-progress or final products with the pieces that led to them;
- items the teacher thinks are important to portray a moment-in-time of the student's development;
- items that reflect where a student is in the skills, knowledge, behaviors, attitudes and so on that the community wants all students to know and to be able to do; and
- items that reflect a unique aspect of the student's learning, background, or interests.

The items should reflect the multipathed and "messy" nature of learning, providing evidence of the paths taken and of those left unexplored. Portfolios can be filled with such items as drawings, sculpture, music, writing, posters, drama scripts, recorded conversations or performances, videotapes, photographs of work, computer records and graphics, published books, finished reports or projects, tests – in short, anything the student produces in the course of learning.

Students' own self-evaluations are often included in portfolios. Student journals can be a valuable addition, as they help students follow their own progress and think about their own thinking and learning, and can provide insights for the teacher. Finally, the teacher may keep running notes or other documentation of a student's progress in the portfolio. In addition to academic data, portfolios can include information on student motivation and other affective areas (Au, Scheu, Kawakami, and Herman 1990). Collections of students' work can be used very effectively by teachers who come together to try to deepen their understanding of a student. In a process called the Collaborative Descriptive Review (Carini 1982), a

Comments from Third Graders about Portfolios

I think portfolios a[re] important because if you really bombed on a paper and I did it again and did better, I could compare it. And I could look back. And I could look and see what I had trouble with.

– Evin
Lake Garda Elementary School
Burlington, CT

I think portfolios are important because I already le[a]rned something. I learned my print improved. At the end of the year, you can look back and laugh at your work. I'm putting in mostly improvement papers but now I'm [changing.] I'm going to put in my best work, and slop[p]y work, poor work and all kinds of work.

– Benjamin
Lake Garda Elementary School
Burlington, CT

Student Instructions for Developing a Portfolio

Portfolio Construction

Your portfolio must have a cover and provide a way to show your work easily.

What to Include

The work you include should not just be your best work; it should show something about your progress during this school year. It should also show your goals for growth and improvement.

Each marking period, your portfolio should include:

Your reading list/log
One written activity or journal letter from Reading
One writing activity [final draft and rough draft(s)]
One activity from Social Studies
One hike follow-up
Two Math activities
Two Science activities
Any other work you choose to include

You will also need to write a portfolio letter that discusses and evaluates your performance in each subject. Explain why you chose to include each item. Finally write out your goals in each subject for the next marking period.

– Kathy Ross, 6th Grade Teacher
Lafayette Regional School
Franconia, NH

student is "presented" through his or her work, and the teachers move 59 through a formal process that creates a rich picture of the student as a "meaning-maker." The purpose is to illuminate the student experience in school and to collectively make recommendations to improve those experiences.

Portfolios have been found to be particularly useful for students who traditionally do poorly on standardized and timed tests (Alvarez 1991), such as for special-education screening. Valencia (1990) notes strengths of the portfolio approach when dealing use with students whose first language is not English:

- it deals with material that the students have actually worked with in the classroom and/or outside of class (e.g., reading material);
- it captures the process of learning over time;

- it is multidimensional and represents student thinking, drafting, revision, and reflection; and
- it is based on active collaboration between teacher, student, and sometimes parents.

The items in the portfolio should be a rich reflection of the real work of learners. Using them as the basis for conversations with students can be both insightful and rewarding. As teachers, parents, or fellow students talk with a learner about the items that are evidence of his or her work, questions such as these may be raised:

- How did you decide to make this particular thing for this assignment?
- What did you have to learn to be able to do it?
- How did you design it?
- What problems did you encounter? How did you overcome them?
- What do you like about what you did? What don't you like? Why?
- What would you do differently if you were to do this again?
- How would you improve your work?
- What did you learn from doing this work?
- What would have helped you do this better?

The student work collected in a portfolio has to be regularly reviewed against established criteria in order to portray a "picture" or "story" of the student's progress over time. Multidimensional criteria may be called for when judging performance on complex concepts or tasks. The rating form of the Vermont Mathematics portfolio (see **Figure 13** on pages 65-66) is quite intricate. It involves judging seven pieces of student work (Entries 1–17) as evidence of the achievement of seven outcomes, e.g., understanding of task (A1), use of mathematical language (B1). For each of the seven outcomes, criteria are provided so that each entry can be rated on a 1–4 scale with 4 representing the highest level of performance. The rating form also lists the sources of evidence that can be used to demonstrate achievement of the outcomes, e.g., explanations, demonstrations. There are four kinds of "pieces" that can be chosen for the entries — a puzzle, an investigation, an application, or other.

Figure 13: Vermont Mathematics Rating Form

[redacted] Student ID Number School Grade: Date: Rater	**A1 Understanding of Task** SOURCES OF EVIDENCE • Explanation of task • Reasonableness of approach • Correctness of response leading to inference of understanding	**A2 How—Quality of Approaches/Procedures** SOURCES OF EVIDENCE • Demonstrations • Descriptions (oral or written) • Drafts, scratch work, etc.	**A3 Why—Decisions Along the Way** SOURCES OF EVIDENCE • Changes in approach • Explanations (oral or written) • Validation of final solution • Demonstration
ENTRY 1 Title P Puzzle I Investigation A Application O Other			
ENTRY 2 Title P Puzzle I Investigation A Application O Other			
ENTRY 3 Title P Puzzle I Investigation A Application O Other			
ENTRY 4 Title P Puzzle I Investigation A Application O Other			
ENTRY 5 Title P Puzzle I Investigation A Application O Other			
ENTRY 6 Title P Puzzle I Investigation A Application O Other			
ENTRY 7 Title P Puzzle I Investigation A Application O Other			
OVERALL RATINGS →	UNDERSTANDING OF TASK FINAL RATING 1 Totally misunderstood 2 Partially understood 3 Understood 4 Generalized, applied, extended	HOW—QUALITY OF APPROACHES PROCEDURES FINAL RATING 1 Inappropriate or unworkable approach procedure 2 Appropriate approach procedure some of the time 3 Workable approach procedure 4 Efficient or sophisticated approach procedure	WHY—DECISIONS ALONG THE WAY FINAL RATING 1 No evidence of reasoned decision making 2 Reasoned decision making possible 3 Reasoned decisions adjustments inferred with certainty 4 Reasoned decisions adjustments shown explicated

Comments

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Figure 13: Vermont Mathematics Rating Form *(continued)*

A4 What—Outcomes of Activities	B1 Language of Mathematics	B2 Mathematical Representations	B3 Clarity of Presentation	CONTENT TALLIES
SOURCES OF EVIDENCE • Solutions • Extensions: observations connections; applications syntheses; generalizations abstractions	SOURCES OF EVIDENCE • Terminology • Notation/symbols	SOURCES OF EVIDENCE • Graphs, tables, charts • Models • Diagrams • Manipulatives	SOURCES OF EVIDENCE • Audio/video tapes (or transcripts) • Written work • Teacher interviews/observations • Journal entries • Student comments on cover sheet • Student self-assessment	Number Sense - Whole No. / Fractions (4) Number Relationships/No. Theory (3) Operations/Place Value (4) Operations (8) Estimation (4/8) Patterns/Relationships (4) Patterns/Functions (8) Algebra (8) Geometry/Spatial Sense (4/8) Measurement (4/8) Statistics/Probability (4/8)
				TASK CHARACTERISTICS
WHAT—OUTCOMES OF ACTIVITIES FINAL RATING: 1 Solution without extensions 2 Solution with observations 3 Solution with connections or applications 4 Solution with synthesis generalization or abstraction	LANGUAGE OF MATHEMATICS FINAL RATING: 1 No or inappropriate use of mathematical language 2 Appropriate use of mathematical language some of the time 3 Appropriate use of mathematical language most of the time 4 Use of precise, elegant appropriate mathematical language	MATHEMATICAL REPRESENTATIONS FINAL RATING: 1 No use of mathematical representations 2 Use of mathematical representations 3 Accurate and appropriate use of mathematical representations 4 Perceptive use of mathematical representations	CLARITY OF PRESENTATION FINAL RATING: 1 Unclear (e.g., disorganized incomplete, lacking detail) 2 Some clear parts 3 Mostly clear 4 Clear (e.g., well organized complete, detailed)	EMPLOYERMENT COMMENTS Motivation / Flexibility Risk Taking / Reflecting Confidence / Perseverance Curiosity/Interest / Value Math

Comments:

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Performances

A performance assessment is a demonstration of a student's control over essential knowledge. It "requires students to actively accomplish complex and significant tasks, while bringing to bear prior knowledge, recent learning, and relevant skills to solve realistic or authentic problems" (Herman, Aschbacher, and Winters 1992, 2). Performance assessments can take such forms as exhibitions, investigations, demonstrations, or journals. Good performance assessments enable students to perform confidently, connect to real learning, and are in themselves an occasion to learn. Performance assessments can provide the community with evidence about the learner's styles and strategies and how he or she is progressing along the established standards and benchmarks. Performances should provide guidance about next steps and areas in need of more work. It is also important that performances provide the community with opportunities to celebrate the learning that is occurring, the community of learners (including teachers and parents), and the learner who has done the work.

Students can perform tasks or activities that capture their learning at a moment in time, that create new questions, and that send them on again into the learning process. Performance activities can be done with another student, a small group of peers, or the teacher or another adult. Performances can be like opening night at the theater, representing months or even years of preparation and conducted before an audience of peers, parents, educators, professional performers, and members of the community. In every case, this type of assessment is indistinguishable from other work performed in the classroom.

The people who judge student performance need formal mechanisms for recording their observations. It should be clear to both the performers and evaluators what knowledge, skill, behavior, or attitude the performance is intended to demonstrate. There should be criteria and standards that are used to determine where the student is in relationship to predetermined benchmarks or, in the case of "final exhibitions," to long-term outcomes.

"Observers" of the performance might use a chart with this information on it to take notes and record questions.

Students can and should be involved in more than just "taking" the performance task itself; they can help determine how it is documented and, ultimately, how it is evaluated. They can help determine who will judge their performance. They can contribute to designing performance observation guides. They can be asked individually or as a group what they think the performance will show about what they know and are able to do and how observers will be able to identify these skills. They can be asked what feedback they want about their learning. The more students are involved in the various aspects of performance tasks, the more they can be expected to learn from the experience of taking them, and the more able they will be to assess their own learning.

Performance tasks don't have to be elaborate. Here are some examples of "mini-problems" that call on students to demonstrate their science knowledge. Teachers can ask students to present a brief explanation (in writing or out loud) of the phenomenon described, along with a quantitative description or solution that uses appropriate mathematics. The explanation can be illustrated through diagrams, graphs, tables, or other means of communication:

- When you open the refrigerator door on a hot day, you feel cool air come out. Can you cool off the kitchen by leaving the door open for an hour? Explain why or why not, describing the different kinds of energy and energy flows involved.
- Explain why a soap bubble floating into air is spherical.
- Design a cup or mug to keep coffee hot longer.
- Why is it harder to stay balanced on a bicycle that is moving very slowly than on one moving quickly? Redesign a bicycle to make it easier to stay balanced going slowly.

Source: The National Center for Improving Science Education, 50: 49.

Student Self-Assessments

Student self-assessment can be done with checklists, rubrics, portfolios, and journals. Journals are an integral part of students' reading and writing, but they are also useful in other subject areas.

Rubrics are a device that can be used by students to measure their own progress. They can be teacher-designed or student- and teacher-designed and can help students stay focused on the task. Students help determine what characteristics are used to measure success on a fixed scale that is understandable to students, teachers, and parents. Formal and informal checklists help students determine their own progress. (Examples of student rubrics and checklists are found in Appendix B-3 and B-4.)

A New Type of Pop Quiz

Popping open a can of soda, Alan Rodas told his senior high school science class that they were about to learn more about one of their favorite beverages – soda pop. They would be given two unmarked samples of soda. Without tasting the pop, students were to decide which was the diet variety and which was the regular kind – based solely on the samples' physical and chemical properties.

Their task was to identify and evaluate promising laboratory techniques for distinguishing the regular soda from the same brand's diet variety. They were to devise a research plan, test the techniques that they had proposed to see which was most reliable scientifically, and apply the technique they had identified on unknown samples of soda. Their work would be done in small groups.

The "pop quiz" was designed to help Mr. Rodas and his class gauge students' progress along several important dimensions, including their capacity to:

- understand scientific concepts and principles and apply them to real-world situations;
- design an empirical test;
- apply scientific modes of thought;
- apply and perform scientific laboratory procedures; and
- work effectively with peers.

Mr. Rodas asked students to get started by themselves. They wrote down at least three ways to distinguish between the two sodas, and explained why they chose those methods.

Then they joined small groups and brainstormed. Each group chose two tests to carry out and designed an experimental plan for these tests. Students chose a variety of techniques, including testing the samples' boiling point, freezing point, density, conductivity, and solubility. Some students suggested using the "sticky test" or urine glucose test strips to gauge sugar content. Some wanted to add yeast and Benedict's solution to test chemical reactions of the samples. Others suggested adding sulfuric acid to identify caramel. Students also proposed testing the samples' aroma, color, and amount of fizz.

To challenge his students, Mr. Rodas put out various pieces of equipment and materials that were not necessarily needed. He encouraged the class to use these materials in ways that were not thought of previously.

Once Mr. Rodas approved their plans, the groups carried out their experiments. Then groups prepared a report of their results and presented their findings orally to the class. Mr. Rodas filled out a form for

(continued)

each group gauging how well they met the objectives. Performance was rated as "excellent," "good," or "needing improvement." If a student's work was exceptional, he noted that.

Each group also rated each member's performance on the following measures: group participation; staying on the topic; offering useful ideas; showing consideration to other group members; judging the extent to which each involved others; and ability to communicate. If the group could not agree on a rating, they could comment on the process.

When the ratings were complete, Mr. Rodas asked the students to finish the exercise by themselves. He told them to imagine that they were given two samples of liquids, one containing a mixture of two sugars (fructose and sucrose), the other containing only one of the sugars.

Students were asked to list all of the tests that had been tried on the soda samples that would also be useful in testing the two new samples. Then Mr. Rodas asked students to propose other tests.

Finally students were asked to react to the experiment, stating what they liked and didn't like; how they felt about working in the group; why they would or would not like more group problem-solving activities; how they felt about using tasks to evaluate knowledge and skills; and what, if anything, they had learned.

Then Mr. Rodas opened up a case of soda and the class happily consumed its evidence.

Source: The National Center for Improving Science Education, 50: 39.

Choosing Assessment Methods

As educators and community members consider how they want to gather evidence about students and programs, they will look at the above methods and try to make good matches between specific methods and the information they are seeking. They will want to review the purposes of assessment and the criteria for judging good assessment. Also, questions such as these may prove helpful:

- What are the purposes of each method?
- What kinds of learning is each designed to assess? Does it assess mastery, ongoing progress, or both?
- What kinds of evidence is each designed to gather?
- What other kinds of evidence may be needed to corroborate the conclusions we draw using each method?

- What kinds of reflection, decisions, and judgments does each method make possible and by whom?

- What might be the intended and unintended consequences of each?

As communities begin to look at all they want for their young people and all that is involved in developing an assessment system centered on learning, it is important to keep in mind that these ideas have serious implications for how everyone in the community thinks about *all* aspects of schooling: from what it is, to where it occurs, to who does what. Teachers, more than any others, will sense their roles changing drastically and will need the support of the community as well as opportunities to develop new knowledge and skills.

For example, at first assessing and teaching simultaneously will seem impossible to teachers. And yet, through examination of their own practice, study of alternative perspectives and strategies, and working together with the support of administrators and the community, they will be able to create a new image of assessment as a process that is a teaching and learning strategy. It is the organic nature of learning and the ongoing negotiation of what happens on a day-to-day basis in the classroom that will determine how a teacher gathers evidence of learning in ways that are themselves a learning experience. The teacher in this process is truly a professional — guiding, facilitating, making decisions and judgments along with students. And the teacher plays a pivotal role in ensuring that assessment is done in ways that can be described, shared with other teachers, and made public to the community. We talk more about the change in roles of teachers and others in Chapter Four.

Evaluating and Reporting Student Progress

The evaluation phase — making judgments based on evidence gathered through assessment — relies heavily on the community having attended to the earlier phases of the process, whether through direct involvement or by regular updates and opportunities for review. Throughout the text, we have emphasized the need to develop an understanding of learning, agree upon standards for student success, and select ways to gather evidence of learning before addressing student evaluation.

Central Park East High School in New York City has a regular meeting where teachers bring assessments and their interpretations of them. The group scrutinizes and compares them with the interpretations proposed by other teachers. Over years of meeting, they have achieved a high degree of consistency. It is a time-consuming task, but for them it is a priority, and they have made the time for it.

Having the kinds of conversations that we propose in this guide about learning, what constitutes success, and what counts as evidence of learning lays the groundwork for making reliable and valid judgments based on assessment data, and on summarizing and reporting that information to the community. In this phase, the community develops mechanisms for agreeing on the types of assessments to be used and on how those assessments will be interpreted and reported. Schools must demonstrate accountability for the assessment practices they agree to implement, and they need to find ways to summarize and report their results. The Collaborative Descriptive Review, blind reading practices, and public

performances described earlier are examples of people working collaboratively to summarize evidence gathered through assessment in order to make judgments about students.

Failure to make judgments public, as well as being unclear about how judgments are made, may be what most contributes to the lack of confidence that some teachers, administrators, community members, students, and parents show in teacher-designed tests and nonstandardized assessments. This lack of confidence is the result of a failure to communicate. Good communication through a process that includes all interested people is a central theme in this guide. A process that creates confidence and trust is one that focuses on building common understandings, of seeing clearly the connections between the decisions made about learning and the evidence gathered thorough assessment.

In order to have an assessment system that is authentic, each school and community needs to review and improve that system continually. The learning environment and the assessments that go with it must themselves be assessed to make sure that they continue to connect to real learning and to the collectively established standards. In addition, the quality of the evidence being gathered and of the interpretations of that evidence, as well as the continuing efforts of the school to build consistency and continuity into the assessment process must also be assessed.

Considerations in Reporting Out

The job of reporting to the community how students are learning is not easy, yet it is made easier by a process that regularly communicates and includes people in ongoing development of educational systems. Authentic learning and assessment is sometimes hard for the community to understand and support because it runs counter to most people's experiences of how students are assessed. Often we hear teachers, administrators, and parents say, "Well, this portfolio (or other authentic assessment method) certainly tells me a lot more about what my child is learning, but how are you going to assess her?" "What grade does this mean she gets?" "How do I know how she's doing or if she's on track?"

Somehow the idea that direct assessments are a more valid form of assessment does not convince people that what they have in hand is a serious assessment and not just a collection of material. Often people still think that a grade is a more accurate measure of learning, even if they cannot tell you what the grade says about what the student knows. Percentages and letter grades hold a powerful place in the collective minds of people whose school experiences were filled with them; they are hard to let go of, especially if there is no clear and, in most cases, simple alternative.

A major concern of parents and teachers about alternatives to traditional grading systems is how students' records will be viewed by the colleges they apply to. Other schools are looking at a wide range of indicators. Some

One school has addressed the problem of the lack of connection between a school's definition of success and that of higher-education institutions by involving local university teachers in reviewing and grading essays. Seniors in the high school must write a final essay on a topic directly related to the school's statements about what all students should know and be able to do when they graduate. A sample set of these essays is given to the university faculty, who are asked to grade them as if they were essays of freshmen in their courses. They then meet with high school faculty to discuss the results and evolve a mutually agreeable grading process.

are asking especially for writing samples or other evidence of student work. As more states and large districts turn to alternative forms of assessment, evaluation, and reporting student learning, colleges will find themselves pressed to accept alternatives or risk rejecting some excellent students.

Although SATs are still required for admission to most colleges and universities in this country, there are some that will accept alternatives, such as Bowdoin College in Brunswick, Maine, and Stanford University in Palo Alto, California.

According to the Coalition of Essential Schools, which has received the endorsement for major K-12 reforms such as alternative assessments from institutions such as University of Wisconsin, University of Oregon, University of Maine (which is collaborating with the Southern Maine Partnership on authentic assessment), the SUNY system, University of Arizona, and University of California at Irvine, many institutions of higher education want to support the educational reforms of elementary and secondary schools by being open to measures of student achievement in addition to the SATs.

In addition to these state universities, the Coalition discovered that Ivy League schools are interested in "a fuller picture" of the students they are considering for admission. The SAT scores alone simply do not tell them enough about the students. These universities have always made it a practice to look at student "folders" in addition to test scores both because they are trying to get a more intricate picture of the student and because they are trying to create a sense of community within the incoming class.

Finally, there are departments at some universities, such as the School of Literature, Science, and Arts at the University of Michigan at Ann Arbor, that require writing portfolios for incoming freshmen.

It makes sense to develop explanatory materials to accompany authentic assessments. The community, colleges, and others need to know how to interpret the information they see about students. They need to know what the assessment tells them about evidence of mastery or work toward mastery of standards set by the school and the community, how the assessment tells them about the standards that learners are setting for themselves, and what the assessment means to colleges and businesses. Reporting formats that move away from the familiar will be less unsettling if these explanations are built right into them.

How the school reports assessment results to parents and the community contributes to success in the long run. In reporting, as in assessing, the more direct and concrete the report, the better. The more closely it is tied to descriptions of students' work toward mastery of standards, and the more closely it describes students' own learning processes, the more powerful and legitimate the report will be.

Some schools and communities are trying to use grades along with alternative measures. In this case, the meaning of the grades needs to be as transparent to learners and the community as the authentic assessments that they summarize. The school needs to be especially clear about whether the grades represent comparative positions of students or are measures of an individual's progress toward standards.

Summary

This chapter has discussed the purposes and principles of assessment. We have examined in detail some alternatives to traditional methods of testing and assessment and created pictures of what those look like in practice. We have provided an overview of what comprehensive assessment is – a combination of traditional, authentic, and student self-assessment. We have examined many of the issues that the community struggles with as it commits to assessment that serves the kind of learning and learning outcomes that it wants for its students. In the next chapter, we turn to a discussion of how learning, teaching, and assessing connect in learning environments where all students can reach these high standards.

Recommended Resources

Anthony, Robert J.; Terry D. Johnson; Norma I. Mickelson; and Alison Preece. 1991. *Evaluating Literacy: A Perspective for Change*. Portsmouth, NH: Heinemann Educational Books, Inc.

Glaser, Robert. September 1992. "Assessment Challenges: Changing Views of Learning, Instruction and Assessment." Handout presented at the Annual CRESST Conference, UCLA.

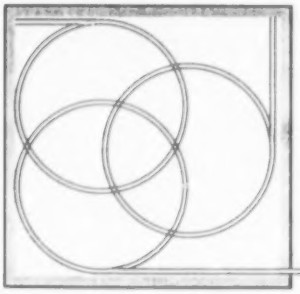
Herman, Joan L.; Pamela R. Aschbacher; and Lynn Winters. 1992. *A Practical Guide to Alternative Assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Linn, Robert L.; Eva L. Baker; and Stephen B. Dunbar. November 1991. "Complex, Performance-Based Assessment: Expectations and Validation Criteria." *Educational Researcher* 20 (8): 15-21.

Marzano, Robert J.; Debra Pickering; and Jay McTighe. 1993. *Assessing Student Outcomes: Performance Assessment Using the Dimensions of Learning Model*. Alexandria, VA: Association for Supervision and Curriculum Development.

Perrone, Vito. 1991. *Expanding Student Assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Wiggins, Grant. Winter 1988. "Rational Numbers: Toward Grading and Scoring That Help Rather Than Harm Learnings." *American Educator* 12 (4): 20-25, 45.



Chapter Four
Getting to the Intersection of Learning, Teaching, and Assessing

Early in this book, we defined *learning-centered schooling* as "education that connects and integrates learning, teaching, and assessing." Success for *all* students is the driving force for all aspects of education, and the work of the learning environment has multiple purposes, with those involved playing many roles so that learning, teaching, and assessing happen simultaneously.

If one could freeze-frame a classroom where this is the case, an observer would be hard-pressed to categorize what is happening as only learning, teaching, or assessing. A teacher observing students is learning and assessing. A student working with another on editing is learning, teaching, and assessing. Where one ends and another begins is blurred, overlaps, or is one and the same. This is not because activities that used to be clearly demarcated as learning, teaching, and assessing have been lumped together, but because the nature of those activities has changed.

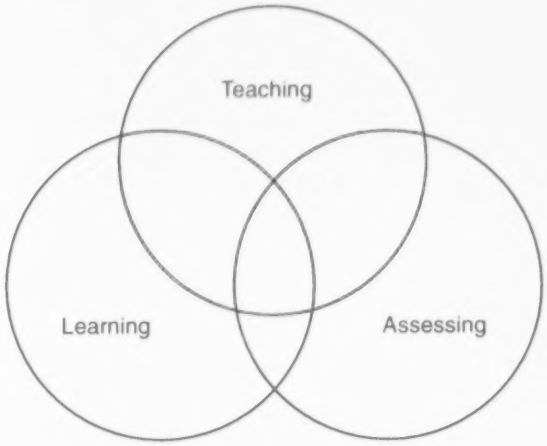
Grappling with the changing nature of these basic elements of schooling is the essence of the community inquiry process outlined in Chapter One (see **Figure 14** on page 78). As resources for community inquiry that describe the changing nature of learning and assessing, Chapters Two and Three invite readers to explore current thinking in those domains. Each chapter suggests some of the implications these shifts in learning and assessing have for teaching.

If Chapters Two and Three represent analysis of individual domains, this fourth and concluding chapter is synthesis, intended to convey, images of what it might look like at the intersection of the three. To do this, we address the question, What would be some of the characteristics of learning environments where learning, teaching, and assessing were integrated?

We begin by reiterating the assumptions that underlie this book and which must frame the final picture. Then we describe eight features or characteristics of learning environments where all students learn and where learning, teaching, and assessing are indistinguishable. For each characteristic, we address the questions, What does it look like? and How would we know it if we saw it? Answers to these questions form a set of indicators that can be used as benchmarks to assess whether a learning

environment reflects a characteristic. For purposes of this chapter, we've grouped tangible observations, or indicators, around each characteristic, though several indicators would be observed around more than one characteristic.

Figure 14: Purposes for Inquiry into Learning, Teaching, and Assessing



Learning:

- To understand how children develop and what their questions are.
- To understand what is known about how people learn.
- To come to consensus about what students should know and be able to do.

Teaching:

- To understand what is being taught and how.
- To develop appreciation of the roles of professional educators.

Assessing:

- To understand effective assessment and a variety of assessment methods.
- To participate in decisions about student assessment and how to report results.

In this chapter, we suggest what these characteristics might look like in action by presenting a set of illustrations of classrooms, schools, and communities. A vignette is presented to bring each characteristic and its indicators to life, although it is important to note that many of these stories might be used to illustrate a number, if not all of the characteristics above. As a reader's guide, we've placed the indicators of the characteristic being presented in the vignette on one side of the page (see Characteristic One

on page 82). In this way, we attempt to make explicit how the situation illustrates a learning environment where learning, teaching, and assessing are integrated. Following each vignette, we also lay out some of the tough issues and questions that are part of making the intersection a reality.

As is the case with the vignettes throughout this book, many of the stories we include come from teachers and administrators currently working to change their schools and classrooms. Some have been adapted to illustrate specific points; others are composite pictures drawn from a variety of situations. The stories are not meant to be images of ideal learning environments; rather, they capture situations where people are struggling to put into practice new philosophies, goals, and ways of working. Some are further along than others in some dimensions of the struggle. All of them have a vision of how they are contributing to the success of all students, and none of them would say that they are "done."

Key Assumptions Underlying This Book

Several assumptions need to be considered in designing environments centered on learning:

- **All children can learn.** There are many aspects of human learning that are true for all people and these should be a foundation for how schools operate. At the same time, every human being is unique. The differences in race, culture, experience, perspective, preference, style, personality, and goals are strengths that should be valued and developed, as they contribute to a rich educational environment for everyone.

- **For all children to develop as successful learners, education must be organized around the learning of every child.** If we continue in the mind-set that every child must move through the same curriculum at the same pace in the same way, far too many will continue to be left behind. Education will continue to be a race, which, by definition, some win and some lose. We must be committed to high expectations for every child, translating those expectations into learning opportunities that enable each to develop fully. Given appropriate opportunities, every child – with effort – can succeed.

- **The community must be involved in the formal education of its youth.** Communities are linked to their schools through the young people. There is no excuse for a lack of connection between a child's life in and outside of school, making him or her feel like "two different people." This connection is important for academic as well as humane reasons. Students should know whatever the community has agreed is important to learn, and should be assessed by means that convey real and meaningful information about how the community is doing in educating its youth.

- **All adults can learn.** Creating learning communities requires that ongoing learning, inquiry, and design work are permanent parts of the way we live. From the President of the United States to local school boards, we are recognizing as a nation that we must create the organizational cultures, structures, and processes for ongoing learning at work and at home, as well as in the school. In the past, we have often tried to make change without investing in the learning of the people who must provide the thought and energy to make new ways possible. "Change is learning," as Fullan and Miles (1992) point out.

These assumptions have major implications for the design of new learning environments.

Just as learners and learning are clearly emphasized in the assumptions that underlie this book, so too does continued attention to them lead to the design of new learning environments that connect learning, teaching, and assessing. **Figure 15** on page 81 reviews how the development of activities that connect learning, teaching, and assessing are based on a shared and new definition of student success. This definition is driven by looking at the research on learning, children's questions, and existing work on standards, benchmarks, and criteria.

Community-wide agreements about what children should know and be able to do form the foundation for the school to design new learning environments.

Characteristics of New Learning Environments

The characteristics that follow come from our work with schools and other organizations, a review of the literature cited in preceding chapters, and other literature from the current reform movement. As with the principles of learning and assessing, we suggest you use these as a starting point for your discussions, elaborating, adding, discarding, and revising as you articulate your own set of characteristics for the intersection of learning, teaching, and assessing.

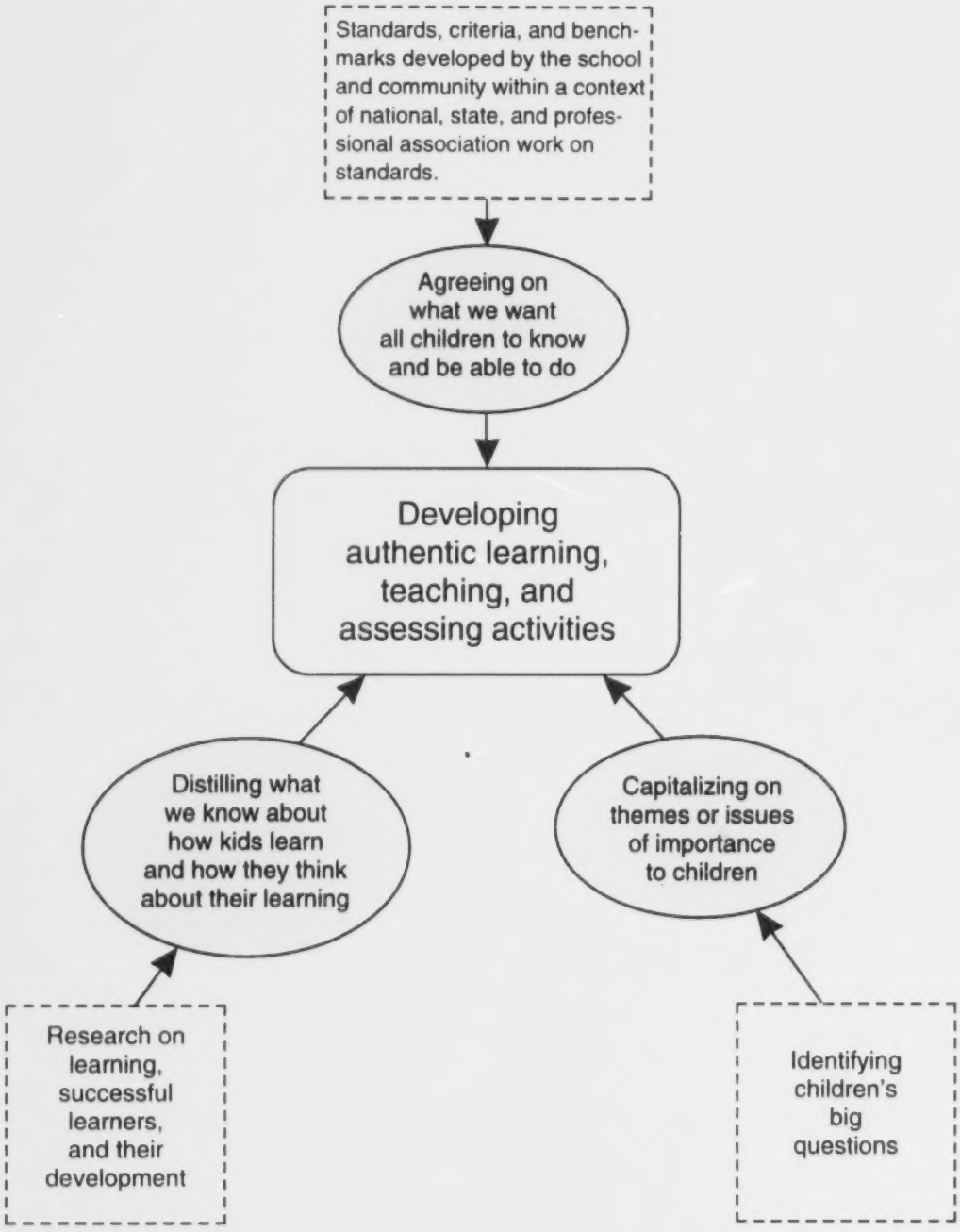
In a learning environment where learning, teaching, and assessing are integrated:

1. Expectations, activities, processes, and structures embody the belief that all students can develop as successful learners.

2. Adults and young people are engaged in authentic work that has several purposes, so that learning, teaching, and assessing occur simultaneously.

3. Shared understandings about the purpose of work – including learning outcomes and standards – guide all work; they are continually revisited and refined.

Figure 15: Building Shared Definitions of and Actions for Student Success


Standards, criteria, and benchmarks developed by the school and community within a context of national, state, and professional association work on standards.
Agreeing on what we want all children to know and be able to do
Developing authentic learning, teaching, and assessing activities
Distilling what we know about how kids learn and how they think about their learning
Capitalizing on themes or issues of importance to children
Research on learning, successful learners, and their development
Identifying children's big questions

4. Adults and young people continually change roles and responsibilities as they develop and integrate the skills of being learners, teachers, and assessors.

5. Everyone participates in ongoing inquiry – including dialogue, learning, reflection, and evaluation – about learning, teaching, and assessing; next steps in changing the system grow out of that inquiry.

6. The "whole child" is the focus of attention, so that family, home, school, community, and larger world are woven together, and students can integrate them as they learn.

7. Learning, teaching, and assessing come from a shared conceptual framework.

8. New definitions of responsibility and accountability unite young people and adults in continuous improvement based on rigorous standards.

9. The language, culture, ethnic, and racial diversity represented in the school becomes the cornerstone upon which learning opportunities are sought and offered to all children and adults.

Many writers (Eisner 1991; Wiggins 1989a; Gardner 1991b; Perrone 1991; Duckworth 1987; and Moon 1992) provide compelling glimpses of the intersection of learning, teaching, and assessing; all of them, in one way or another, substantiate that the changes required to get there are nothing short of profound. Imagining and creating the integration requires thinking about education with a whole different lens, shedding many long-held assumptions about what must happen in schools, and altering conceptions about change.

Characteristic One: Expectations, activities, processes, and structures embody the belief that all students can develop as successful learners.

Indicators	Vignette
	In a Vermont elementary school, a fifth-grade girl has finally learned to read. It is a breakthrough for her and her teachers and a testament to her town's commitment to the belief that every child can learn.
1-1. Educators develop in-depth knowledge of each youngster, such as his or her learning style and preferences. }	When the girl we'll call Marcy started kindergarten, her speech was unintelligible, even though she had been attending the public school's early childhood education program since the age of three. In that program, a speech and language therapist worked

(continued)

Indicators *(continued)*	Vignette *(continued)*
	with Marcy individually and in small classroom groups to develop language techniques. Before entering kindergarten, Marcy was diagnosed as severely language-disabled, yet her nonverbal IQ tested almost average.
1-2. There is mutual respect among educators, students, and their families. }	In another system, Marcy might have stayed in a special-ed class for the remainder of her school years. But Marcy's community had participated in a townwide goal-setting process for the schools and had pledged to do whatever they could to ensure that every child was given the highest quality educational opportunities. In addition to mainstreaming students as much as possible, the town approved a school budget that allowed teachers to meet for weekly 60-minute sessions on classroom issues.
1-3. Organizational culture and arrangements include time for adults to learn, to coordinate and consult with each other, and to design programs and materials for students. }	
1-4. Expectations for all learners are standard and jointly agreed upon; yet the routes to learning are numerous and varied. }	By kindergarten, Marcy's teachers were looking for more direct ways of reaching her. They noticed that she enthusiastically mimicked the rhythms of the ABC song. After reviewing some resources developed by special education and early childhood researchers, Marcy's teachers designed a language skills strategy based on singing the rhythms and sounds of the alphabet.
1-5. Educators and others deepen their knowledge of how humans develop and learn, then apply their understanding to designing learning experiences. }	As Marcy grew, her teachers met in teams to coordinate their approach with the speech therapist, who stayed with Marcy for several years. They worked with Marcy's parents to develop plans that extended her learning at home. Each teacher built on the previous year's strategy and developed it further as Marcy began repeating sing-song sounds, then words, then gradually moved to a more standard manner of speaking.
1-6. The learning environment is safe for intellectual risk taking, acknowledging that failing is part of learning and promotes questioning, not just answering. }	Marcy's classmates participated in the "word songs" too. By third grade, Marcy was nearly at grade level in mathematics and participated happily in class activities, though her language was still limited. She spent 80 percent of her day in the classroom and continued to receive individual language therapy. That year, Marcy and her classmates were also eligible to participate in the

(continued)

Indicators *(continued)*	Vignette *(continued)*
	school's music program. All interested students were encouraged to learn a musical instrument in weekly lessons. Marcy picked the xylophone.
1-7. The structures of learning settings are flexible so that every student who walks through the door can thrive. }	Now, Marcy is in a standard fifth-grade class, communicating effectively with her peers, and reading well at a first-grade level. She also plays the xylophone in the school band concerts.

Further Thoughts for Community Inquiry

As the focus shifts to students and robust learning, educators at all levels are finding that they, too, have an enormous amount of learning to do. In many communities, educators are discovering that they have much to offer one another across the boundaries of specialization and levels of schooling.

For example, in schools where all students learn together (rather than being divided according to ability or special needs), teams of teachers work together with the students. "Regular" and special education, Chapter 1, speech therapy, and other specialist teachers know that students need a coherent set of learning goals. Working in teams encourages that unity and allows teachers to acquire new knowledge, skills, and dispositions. Teachers across the levels of schooling need to exchange knowledge as well.

In a speech to the Board of Directors of The Regional Laboratory for Educational Improvement of the Northeast and Islands, Elisabeth Schaefer, Director, Bureau of Early Childhood Programs, Massachusetts Department of Education, made the following observations:

> *Good teachers of young children have always used real-life examples to help connect new ideas to what children already know, have had children practice new skills on authentic projects from simulated grocery stores to real aquariums, and have used concrete materials to teach new concepts.*
>
> *In assessing young children, educators have often used a variety of methods — parent interviews, the child's history, the teacher's report from the previous year, performance portfolios over time, and so on. For many years, schools have operated as if students did not need these kinds of learning experiences past the early elementary years. It was as if to say to children, "Okay, the fun is over, now we're going to get into real learning." And, unfortunately, that meant engaging in nonauthentic, nonexperiential learning activities.*

> *Such a variety of teaching and assessment methods, as well as flexible student grouping, such as multiage, is now being advocated for all students throughout their school career (1992).*

Elementary school teachers can learn about critical concepts in subject areas from their middle and senior high colleagues who are subject specialists. Instead of being divided into teachers with subject expertise or specialists in learning and development, educators are beginning to see themselves as part of a joint enterprise that carefully integrates knowledge development and human development.

Not only are the structures and activities different in an environment that promotes success for all, but the whole culture and climate is as well. We believe learning occurs best in places that are safe and uncomfortable. It is easy to confuse the two concepts: safety and comfort; yet, understanding the differences is key to creating the kinds of learning environments described in this chapter.

Much has been written about the need for learning environments to be safe – physically and emotionally. What receives less attention is the need for intellectual safety that promotes authentic learning. Regardless of what else we do, neither adults nor children will take risks to grow if the environment feels like a dangerous place in any way.

By uncomfortable, we don't mean physically; we mean intellectually. Dewey and Piaget talked about disequilibrium, dissonance, or discomfort as the driving force that motivates students to learn. Problems, by definition, are upsetting, not emotionally, but intellectually. They make the learner take risks, pushing beyond what is known. It is this working at the "edge of uncertainty," the "edge of incompetence" that challenges the learner to create new knowledge and understandings, to redefine himself or herself, and to grow.

This is not to say that every second of a student's life in school should be like this. Yet, the general ethos of the learning environment should support students as they experience the growing pains of expanded understanding. Many schools in our country have the wrong combination of these qualities. Imagine the danger to young people trying to learn in an environment that is unsafe and uncomfortable or the banality of a setting that is safe and comfortable.

These are some of the issues that need to be addressed when a school community is carefully examining structures and processes in schools to see if they reflect the belief that all students can learn.

Characteristic Two: Adults and young people are engaged in authentic work that has several purposes, so that learning, teaching, and assessing occur simultaneously.

Indicators	Vignette
2-1. Students learn the habits of reflection, such as self-assessing and -evaluating continually, toward becoming self-directed and -managing learners. *2-2. Students' deepening understanding is what drives work, with learning goals revisited often.*	A fifth grader we'll call Matt is learning to integrate assessment with his classroom work: "When you do the work, it might be good, but you have to ask yourself, 'what does *good* mean?'" Matt reflects. Matt's teacher builds a critical evaluation and assessment tool into every project. For example, students learn to evaluate their own writing according to goals, set by the class, that range from purpose and clarity of expression to appropriateness for itended audience. These goals may be revised or expanded as the project takes shape.
2-3. Students work in mixed groups, learning to design and conduct tasks cooperatively. *2-4. Assessment is woven throughout the work, not attached to the beginning or end only.*	Stories are shared in peer groups' and students give each other feedback about the elements that are effective and others that are confusing. The young authors then learn to weigh the feedback with their own best sense and make revisions as they see fit.
2-5. Time is available in flexible blocks, with teachers and students in charge of their time, rather than a master schedule dictating the structure, rhythm, and pace of learning. *2-6. Students, teachers, and other adults are regularly engaged in project work that has meaning beyond its function as a means to master the curriculum.*	Matt's school is working to integrate learning, teaching, and assessing skills in all classrooms. For a unit on town history, all sixth graders interviewed local senior citizens about memorable events in their lives. Each student reviewed his or her first draft with the person interviewed and made changes based on their responses.
2-7. Teachers and other adults work as learners along with students. *2-8. Issues and needs in the community provide opportunities for student work.*	With donated time and assistance from a desktop publishing firm, the students and their teachers learned how to print the town lore in a student-designed booklet. The booklets were shared with community members at the town's Heritage Day celebration that spring.
2-9. Community members and others form the audience for student work. *2-10. There are explicit agreements among teachers and students about the climate for learning.*	In Matt's school, student evaluations consist of portfolios of work students choose themselves, written student self-evaluations, and written evaluations by the teacher. Here, students, teachers, and community members act as students and teachers, and everyone plays a role in assessment.

Further Thoughts for Community Inquiry

Zessoules and Gardner (1991) talk about assessment as "a moment of learning." In settings where learning, teaching, and assessing are indistinguishable, the nature of the work of students and adults looks substantially different from traditional classroom practice.

Learning and teaching need to be designed as an invitation into the age-old debate about what's important to know and how we know it, what counts as quality work, and so on. Ideally, students need to be a part of that debate as a part of their curriculum. It also encourages us to remember that curriculum is a means to an end, not an end in and of itself. As a California teacher recently observed:

> *. . . [A] revolution has taken place in my classroom and in classrooms like mine across the state. . . . [W]e have moved beyond a skill-based curriculum, which has to do with teaching, to a meaning-centered curriculum, which has to do with learning. Because of this shift, student work has become the center of education. Teachers no longer follow the guidelines of publishers but, instead, look at their students to determine what must happen next (Evans 1993, 71).*

Achieving learning-centered education ultimately depends on the ability of a community and school to design environments where what is going on is really meaningful to students. Crucial to achieving this end is ensuring that students can relate to, and make sense of the way learning is organized, the outcomes that are expected of them, the content addressed by the curriculum, the tasks that are being performed, and the issues and themes that are placed at the center of classroom activity. Creating such an environment is what teaching is all about:

> *. . . [G]ood curriculum must be individually appropriate to the needs and interests of the children in a program. In addition, it must be culturally salient and locally relevant and meaningful in the context of a specific community. . . . [W]e place great value on emergent curriculum, what successful teachers do in conjunction with and in response to children (National Association for the Education of Young Children 1991, 23).*

Not only is the work in these settings different, but the environment is as well. Students, teachers, and possibly others share responsibility for creating and maintaining a climate that is conducive to authentic learning.

Contract of Expectations

Each year Maria Poole negotiates with her students a set of expectations and rules for their classroom community. She does so after a lengthy discussion of such questions as:

- What would we find in a community that shows concern and interest for its members?
- How can we ensure that all members of our school community are safe and have an equal opportunity to learn?
- What expectations can you "live with" to ensure that everyone has an opportunity to meet with success and to thrive and grow in our individual classroom environment?

Here are the rules created by one class:

1. Unless given permission, keep your hands on your own property.
2. Raise your hand before speaking (when it's appropriate).
3. School property will not be misused and/or destroyed.
4. Treat others as you would like to be treated – with respect.
5. Take responsibility for appropriate behavior when the teacher is in or out of the room.
6. We will not leave the classroom without permission.
7. We will demonstrate control over our own behavior (no cussing, hitting, name calling).
8. We will practice good sportsmanship and use of manners.
9. We will listen when someone is speaking. We all have a right to be heard.
10. We will make decisions by reaching consensus or by democratic vote based on the given situation.

– Maria Poole, Teacher
Belle Sherman Elementary School
Ithaca, NY

Characteristic Three: Shared understandings about the purpose of work – including learning outcomes and standards – guide all work; they are continually revisited and refined.

Indicators

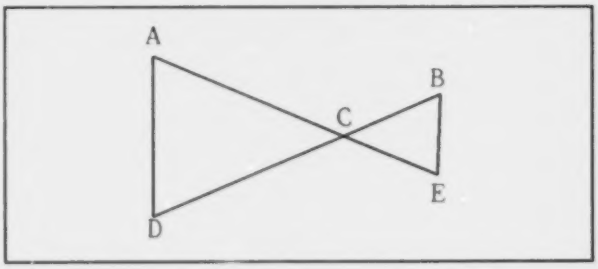
3-1. Students and adults actively use metacognition – that is, they think and talk about the ways they are thinking, learning, figuring things out, solving problems – to guide their work.

3-2. The tension between approaches that focus on students developing their own understandings and those that set standards for students to achieve is recognized, and people work to reconcile them in a way that honors all parties.

3-3. Teachers, students, and others work together to shape multiple learning routes to the same outcomes and standards, including a myriad of ways to demonstrate progress and mastery of those outcomes and standards.

3-4. Students and adults engage in self-assessment and self-evaluation as part of the routines of work.

Vignette



A high school geometry class is challenged by their teacher: "What can you say you know for sure about this diagram?" he asks, pointing to a drawing on the blackboard. They begin to answer with observations about angles, lines, and shapes. "Are you sure?" he probes. "How do you know that?" He guides them through a lesson about deductive and inductive reasoning, constantly pushing them to give reasons for their thinking, then they break into groups to continue working.

The teacher is determined to connect geometry with his student's lives. Each student has identified a set of personal learning goals and an area of interest that relates to geometry. Their interests range from architecture to boat design, from billiards to landscaping. Individuals and groups pursue the geometry questions posed in class through their own projects.

The teacher combs his network of friends, educators, and parents for resource people in each identified area of interest who respond to students' individual projects and questions. These "experts" may be available to students as they research their problems, and may serve as an audience when students present their projects.

The teacher encourages the "experts" to ask students questions about their assumptions and knowledge, and to make judgments about the quality of the projects based on criteria set in advance by the students.

(continued)

Indicators *(continued)*	Vignette *(continued)*
	In this college-oriented community, some parents have expressed nervousness at the teacher's reliance on projects and performance-based assessment. However, the teacher uses these nontraditional methods in conjunction with standardized tests, on which the students have consistently done better than average.
3-5. There is ongoing dialogue and negotiation among students, teachers, parents, and others about what counts as quality work, which is integrally connected to outcomes and standards. }	The teacher speaks openly with parents about wanting to create as full a picture as possible of each student's knowledge and skills, including some that are not measured on standardized tests, such as the abilities to ask good questions and to determine the next steps in solving a problem to which there is no one right answer.

Further Thoughts for Community Inquiry

With knowledge and information growing at an exponential rate, it is all the more important that people in formal learning environments ask over and over, "Why are we doing this?" "What do we want students to learn from this?" "What is most essential for young people to know and be able to do from their learning experiences?" and so on, lest there be a drifting from or forgetting of purpose.

It is especially easy to drift from purpose when engaged in the kinds of long-term, real-life learning experiences that this guide advocates. For example, a group of biology teachers working on curriculum development meet to discuss what scientifically literate citizens need to know and be able to do. Suppose they are in a community that has developed outcomes for science that include important scientific concepts (e.g., food webs, photosynthesis), attitudes (e.g., respect for the environment), and skills (e.g., designing experiments).

The biology teachers might decide to collaborate with the local fish and wildlife agency to engage students in a study of stream quality as a way to help them achieve these outcomes. This has the makings of a wonderful learning experience. However, having students net fish and other aquatic life in a stream on a regular basis can easily devolve into an elaborate vocabulary lesson if they spend all their time counting and naming the animals that they catch. Or learning can be diffused if students pay too much attention to the makeup of their investigating teams and the different roles team members need to play. Teaching, learning, and assessing merge when such an elaborate investigation is framed by important questions keyed to standards established by the community. Students regularly ask themselves and each other, "What are we learning?" and "How do we know what we think we know?"

The findings of students' explorations lead to more questions and further investigation. In this situation, as in others, sticking to the purpose can make "authentic" learning experiences fruitful; otherwise, they can end up exhausting people and resources without accomplishing the desired learning outcomes.

> *Decisions we make about what to include and what to exclude from the programs we offer are of foremost importance. But programs, no matter how well-conceived, must always be mediated if they are to influence the lives of those with whom we work. This process of mediation, at its best, is an artistic activity. We call it "teaching." When teachers transform the inevitably limited and schematic conceptions of school programs into the kinds of activities that genuinely engage students, when they create environments that open up new vistas and provide for deep satisfactions, they make a difference in the lives that children lead. No curriculum teaches itself; it always must be mediated, and teaching is the fundamental mediator. (Eisner 1991, 11)*

Even when they have agreed on student outcomes, communities still have much work to do to get to the types of learning experiences they want for *all* students. The actual design of these learning experiences will largely be the task of educators, students, and those community members who are actively involved with education, but as many community members as possible should understand the idea of different learning routes for different students.

Learning routes are not tracks, but are patterns of learning experiences that students pursue to develop the knowledge, skills, and dispositions that characterize an educated citizen. Learning experiences will differ from student to student, not because of predetermined ideas about ability, but because students and the adults working with them will craft sequences and configurations that mesh what students should do, need to do, want to do, and are good at. This does not mean that students are learning only what they think is important, but it does mean that they have many choices of ways to learn as well as what to learn. This results in schools and districts increasingly focusing on "guidelines" for curriculum rather than specified curriculum "scope and sequence."

Characteristic Four: Adults and young people continually change roles and responsibilities as they develop and integrate the skills of being learners, teachers, and assessors.

Indicators	Vignette
	Even after a few years of no pullout programs, with resource teachers coming into the classrooms to work with identified students, it still felt like the educational program was being delivered in pieces in this diverse elementary school. Many students required special services, but the staff had a commitment to promoting the successful education of all students regardless of need or label. They decided to try a truly integrated, collaborative approach where groups of adults with a variety of expertise would be responsible for all the needs of multigrade groups of children.
4-1. While there are still specialized roles, adults are developing many skills to deal with young people's development in cognitive and affective domains.	
4-2. As educators seek to deepen their understanding of learning, teaching, and assessing, external consultants work in classrooms and other learning environments, pursuing rigorous, long-term projects.	An outside consultant came in to work with the teachers in their classrooms. She helped the teachers think about how they might conceptualize their work and roles to pool their expertise and work as an interdependent team. Together, the staff and consultant created mechanisms to share within and across teams. As the staff developed trust and loosened their need to control "their territory," they began to recognize that sharing their expertise enabled them to broaden their focus and help more students. When the staff first moved to this approach, some teachers felt uncomfortable sharing their "territory." One complained, "I feel like I'm sharing *my* kids and *my* classroom with other people." Another said, "It's really hard acting like this classroom and these kids are all of our responsibilities; I keep wanting to delegate, like I'm the lead teacher."
4-3. Specialists, such as special educators and remedial reading teachers, move beyond targeting their assistance to students who have been identified as having special needs, to teaching with regular classroom teachers to meet the unique needs of each student.	

(continued)

Indicators *(continued)*	Vignette *(continued)*
4-4. Educators at all levels seek understanding of how people learn and look to the developing knowledge base about learning to help them.	The implications of this new approach were felt by everyone, including administrators, nonprofessional staff, and so on. The psychologist found that, unlike the other elementary school with which he worked, he was not getting any referrals of students here. Did the changes in roles and responsibilities of staff mean that every student was suddenly in harmony with the school environment? Were there no more problems that needed his expertise? He doubted it.
4-5. School district office, higher education, and other educational organization personnel assume roles of learners alongside teachers and principals. Each role group works with others to deepen knowledge and understanding in a shared way rather than one group doing it to another.	The school principal reassured him and challenged him to learn new ways of working. He would need to be in the classroom, working as part of teacher teams, facilitating whole-class activities to help children solve problems constructively, and develop coping and socialization skills. Discipline problems began to decrease markedly, something that used to exhaust teachers. The staff felt it was because the students were engaged, were taking responsibility for their own learning, and felt cared about by a community of adults. The school's commitment to the success of all children affects how they instruct and assess students. They look at all students as having strengths and weaknesses that deserve attention. This approach requires careful monitoring of student progress and shared understanding among staff, students, and parents of what is expected and how one can tell how a student is doing. They don't want anyone to fall through the cracks.
4-6. Parents are recognized for the knowledge they have about their children; they are partners with educators in fostering their children's learning.	Instead of report cards, many parents have taken the school up on its offer to look at their children's progress in a narrative conference, using artifacts of the students' work. As the principal said, "We're trying to communicate continuously among ourselves and with parents so that everyone understands where the child is and what he or she may need at any given time."

Further Thoughts for Community Inquiry

As Phil Schlechty suggests, we must work together to make sense of current trends in education – because what we're doing constitutes whole new ways of working. ". . . [W]e are not on the cutting edge of knowledge; we are on the cutting edge of ignorance" (NSDC keynote address, Dec. 1993, Dallas, TX).

Changes in people's roles are probably the most upsetting because they affect individuals at a personal level. When people ask, "What's my role now?" they are in some ways asking a question of usefulness. They are expressing discomfort not just with doing things differently, but with being a different person or playing a different role. They are thinking, "What am I supposed to do if I am not supposed to do what I've always done? How can I contribute? Is there a place for me? Am I capable of the new role?"

One circumstance that feeds these questions for teachers is the shift from leader and expert to facilitator, coach, *and* learner. Many teachers feel that they must choose between directing the class and letting student inquiry set the direction. They may swing so far to not interfere in student inquiry that they wonder how they are supposed to help students learn. What is the balance between leading students and supporting them in following their own questions?

> *. . . [T]he artificial dichotomy between spontaneous, constructed learning and school-related learning is reflected in arguments over child-initiated vs. teacher-directed instruction. The fact is that children construct important learning, particularly physical and logical-mathematical knowledge, through child-initiated, spontaneous activity. But they also learn a great deal from adults. For example, language learning begins in the parent-child relationship; and language is the essential prerequisite for communication (Smith-Burke 1985). Rather than dichotomizing aspects of learning and/or teaching, the teaching-learning process is better characterized as an interactive process. (National Association for the Education of Young Children 1991, 25)*

Overseeing this interactive process is a new role for most teachers and others taking part in educating young people, and therefore produces some degree of discomfort. It is important to remember that these feelings are natural and are experienced by everyone.

As roles change, there will be major changes in how people spend their time. A superintendent in southern Maine recently suggested that teachers' time should be structured so that they spend 50 percent of it with students and 50 percent learning about the latest research in teaching and child development, designing authentic experiences, analyzing data about students, and evaluating progress and their own institution. He did not mean that students should have 50 percent less contact with adults, but

that staffing in schools needs to be configured to make significant research and development work possible for all teachers.

As research and development, inquiry, learning, and evaluation become important roles for educators in schools, there will be a corresponding shift in the roles of staff in other educational organizations. As one teacher from a rural school commented, "We've always had the idea that we have to go 'elsewhere' to learn; now we've discovered we can stay home and work with our own children, learning as we go." Professional development used to be almost totally based in higher education, then there was a move to lodging it in central offices. Now that capacity is shifting increasingly to the school, with the district office playing a facilitator and coordinator role.

Many teachers thrive in their roles as educators because they themselves like to learn. They have been accustomed to learning in order to pass on information to students. Now many teachers are learning to thrive in a role of co-learner with their students, modeling the learning process. They are spending their out-of-classroom time discussing student work with others, learning about learning and assessing, about new developments in science and other arenas, and so on. As one coordinator in a Maine high school put it, this way of working means "gut-wrenching" change and reconceptualizing oneself as a learner as well as a knower and one's work as learning as well as teaching (Cox and deFrees 1991).

In short, new definitions of student learning are transforming the roles of educators at all levels as well as the organizations in which they work. As role changes occur, such as those described above, teaching, learning, and assessing are more likely to be integrated.

Characteristic Five: Everyone participates in ongoing inquiry — including dialogue, learning, reflection, and evaluation — about learning, teaching, and assessing; next steps in changing the system grow out of that inquiry.

Indicators

5-1. Students who ask provocative questions are not seen as questioning authority but as sharing responsibility for continuous improvement.

5-2. Organizational time is given to inquiry, research, reflection, and evaluation.

Vignette

A Connecticut middle school, dedicated to supporting student inquiry, followed one seventh grader's urgent question to Hartford, to see if they all could better understand how the homeless men and women in that city had come to their predicament and to see how the students and their school might help.

(continued)

Indicators *(continued)*	Vignette *(continued)*
5-3. Teachers and other adults ask questions they don't know the answers to.	The distinctions between teacher and students dissolved as they came face-to-face with this immense social crisis. Side by side, they volunteered at shelters and in soup kitchens. In school teams of teachers and mixed-grade students they tape-recorded interviews with those whose lives had been turned upside down by addictions, economics, poor health and mental illness.
5-4. Asking good questions is everyone's job, not just the teacher's. Framing questions, collecting information, and analyzing information are skills that everyone learns how to do.	
5-5. Parents are encouraged to ask questions about their children and educational issues – and they do.	A group of about a dozen students, with the assistance of their history teacher and several parents, campaigned to open the school's old gymnasium to homeless families. Together they learned about building codes, political processes, and ultimately, how to live with defeat.
5-6. Students learn not only "answers" in their studies, but also about the many unresolved questions that abound in every discipline and occupation.	
5-7. The climate fosters taking risks to change organizational structures, experiment with solutions to tough problems, and so on. Debate and multiple points of view are welcome.	The school publishes an annual report that highlights the year's best work in every grade level. Reflecting on the year-long homeless project, the school's superintendent wrote, "This is what we strive for. This is education at its fullest realization."

Further Thoughts for Community Inquiry

Inquiry is an important thread that connects learning, teaching, and assessing, yet few teachers are used to structuring learning around inquiry. Such a learning environment has a different emphasis than what most of us are used to and requires skills and habits that many of us have not developed or pursued. Environments where questions are being asked that do not have prescribed answers demand that teachers, parents, and administrators become learners too.

Students have much to learn about functioning well in such a learning environment. The longer students have been in a more traditional educational setting, the more skeptical they will be that questions are valued and that their questions can create the path for their own explorations and learning.

What is the first thing a student thinks when he or she doesn't succeed with a problem the first time? "I'm stupid." We must create learning environments that send a clear message to students that success with a problem is not a quick right answer. Problems worth solving often have very complicated solutions – and some have no one correct solution (if

they have one at all). Students need to hear the teacher say and reinforce that "struggle is encouraged here," and they need to see the teacher model that struggle with difficult problems to which she or he does not know the answer. As Wiggins (1989c) notes:

> *The test for modern curriculum is whether it enables students, at any level, to see how knowledge grows out of, resolves, and produces questions. Rather than the TV-view that by the end of the class or school career all the "answers" have been "taught" and tied together in a happy ending, closure would consist of taking stock of the current state of the boundary between one's knowledge and ignorance, and gauging the depth of one's grasp of the questions. In short, the aim of curriculum is to awaken, not "stock" or "train" the mind. That goal makes the basic unit of a modern curriculum the "question." Curriculum should therefore be organized around essential questions to which content selection would represent (necessarily incomplete and always provocative) "answers." [There should be] . . . clear inquiry priorities within a course, around which facts are learned. . . . All student inquiry, specific labs and assignments, and final exams would be used to ascertain the degree to which the student understands the question. And essential questions should recur in different . . . course[s]. (46-47)*

Wiggins continues to emphasize the importance of developing inquiring minds in students and of following students' questions. He even suggests that students develop the questions for final exams.

Many educators are concerned about developing students' self-confidence and self-esteem. Although young people can probably never get too much positive adult contact, praise, and encouragement, these doses of caring are only part of the formula for improving a student's self-concept. It is crucial that students do well on challenging tasks that are meaningful to them. It takes caring and repeated successful performance to feed a positive sense of self.

Characteristic Six: The "whole child" is the focus of attention, so that family, home, school, community, and larger world are woven together and students can integrate them as they learn.

Indicators	Vignette
	The Chicago elementary school principal knocks on the glass panel of the third-grade classroom door. A teacher unlocks it from inside and opens it to admit the principal and her guest to the class in progress. Every classroom in this urban school is kept locked by teachers, yet the overwhelming sense is one of safety and harmony, not fear and danger.
6-1. Educators and other community members use ingenuity and inventiveness to provide the best for all young people, in an attempt to offset inequities in funding and other obstacles.	
6-2. Families and other community members are used as resources to enrich learning and integrate students' lives in and out of the classroom.	The principal, a self-described maverick educator, recruits all parents not employed to spend one day a month at the school, and many of them do, working in the library, helping out in classrooms, or telephoning and writing community members to support the school's extended day program.
6-3. Every young person is considered in the context of a caring family or other support system; all policies and practices are designed to strengthen that support system.	She has also formed an agreement with several area businesses that employ some of her parents to release them from work and pay them to assist in the school a half day a month.
6-4. Health and human service agencies have facilities either on school grounds or nearby; personnel from these agencies work together and with educators to serve young people and their families respectfully, efficiently, and effectively.	Parents can drop by a classroom, renamed the Parent Pad, for weekly presentations by community social workers and others on child development, discipline techniques, and other topics of interest. Other times, parents share advice and tips in the unstructured network that has evolved.
6-5. Parents' questions, issues, and ongoing learning are important parts of school and agency work.	
6-6. What has traditionally been considered "school," the eight-to-three experience, is linked closely with informal education activities, such as those sponsored through the Girl and Boy Scouts, YMCA, local museums, and clubs.	School doesn't end at the last bell. A full 70 percent of the students stay for an extended-day enrichment program funded largely through federal grants, but critically supplemented by the community volunteers and contributions recruited by the parent outreach effort.
6-7. Community members reflect the attitude that only the best (facilities, teachers, opportunities) will do for our young people, rather than "what was good enough for me is good enough for them."	In after-school classes, students take dance lessons, learn soccer, do homework with adult volunteer tutors, or join a chess club.

(continued)

Indicators *(continued)*	Vignette *(continued)*
6-8. Students are as likely to be found learning outside of school walls as inside; for example, apprenticeships in the community are integral components of learning.	Sixth graders are eligible for a special, off-campus honor called "mentorships," that pair a student with an adult, often a small-business owner, for weekly visits and exposure to that person's occupation.
6-9. Every young person is known well and nurtured by several caring adults; no student is allowed to "fall between the cracks."	The principal knows each student by name and calls to several while passing them at a brisk clip down the hallway. Later, she explains her nonexpulsion policy. "They want you to throw them out," she says of students she calls "my troublemakers." But, she adds, "Why should I give them what they want? I want them right here." Students are mainstreamed as much as possible, but a special classroom does exist for partial pullouts of students with very difficult behavior problems. "Lots of people would write off this community," she says at the end of the tour. "But these people share strong bonds with each other. What I'm trying to do is focus that on educating our children." In a tough setting with many obstacles ahead of her students, the principal is committed to a solid elementary school foundation. "This is the place to go all out," she says. "We can help them develop what they need to make it in the real world."

Further Thoughts for Community Inquiry

As educators well know, young people bring to school not only their strengths and insights, but the issues, crises, and traumas of their lives outside of school. While schools cannot solve the social problems of our time, they can provide young people with a caring, safe, and supportive place to learn. Schools can also be the location for many of the physical health, mental health, and other services needed by young people and their families so that educators have others with whom to share the responsibility for addressing the whole child.

Creating the natural links between schools and their communities requires a shift in thinking for everyone. Key questions for discussion include: What is the role of parents, community members, and community agenciesa and organizations in the school? How can learning become the province of the whole community?

Across the country, schools and their communities are working together to create rich opportunities for their young. They are doing so to make resources go further, to adjust to the fluctuations in numbers of students, to make sure that students have access to the most sophisticated technology, and to make sure that the young see connections between school and the world. To do so, educators and others are building connections between organizations and constructing learning routes of many different types. These are not "special programs," but routine arrangements.

In Pennsylvania, for example, young people work formally as apprentices in machine shops and other facilities using the most up-to-date equipment (Kiester 1993). They are assessed and evaluated not only by their school teachers, but also by their supervisors on the job. Similarly, in Cabot, Vermont, students routinely use the well-equipped laboratories of the Cabot Creamery for their science work, which is evaluated by the laboratory supervisor as well as by their science teachers.

In Manassas, Virginia, high school and college students learn statistics and other special topics together at the high school; Northern Virginia Community College provides instructors and the high school provides the space. This arrangement was born of necessity, as well as convenience, for the college and the high school. With only 312 students, Manassas Park High has trouble attracting enough pupils to fill advanced classes and paying for them. By the same token, the community college's Manassas campus is chronically short of space to hold classes and is happy to have the classrooms at Manassas Park (Odum 1993).

These types of arrangements will increasingly become the norm as the lines between organizations blur. As people recognize the enormity of the learning task facing the nations, they will recognize the need to pool resources to create the highest-quality learning environments.

Characteristic Seven: Learning, teaching, and assessing are based on a framework developed from concepts that members of the community share in common.

Indicators	Vignette
7-1. Educators, parents, students, and other members of the community work together to develop shared understandings about learning, teaching, and assessing.	Incoming kindergarten students and their families in a rural New York town get an early taste of school in an innovative "bridging program." Developed by a multirole advisory committee, the program helps to make the transition from pre-school to kindergarten smooth and productive. The bridging program aims as much at making the school ready for entering students as it does at evaluating the children's readiness for school. Using guidelines developed by an early childhood educator, teachers observe entering kindergartners in a special nine-day summer session, consisting mostly of structured and unstructured play activities. The children get a chance to become familiar with the classrooms and school environment, while the teachers evaluate their language, spatial, and social skills.
7-2. Teachers work with students to design many different routes for developing desired outcomes according to high-performance standards.	The teachers and principal place children in classes for the coming year, trying to achieve maximum heterogeneous groupings. They also begin designing programs based on what they learn about each incoming student and the class as a whole. The teachers are paid for the summer session and collaborative planning from a special fund set aside for program development.
7-3. Teachers have a broad repertoire of teaching strategies and approaches that they can draw upon as the needs, styles, and interests of students dictate.	As a result of the observations, units on conflict resolution and hand exercises to develop muscle control were added to one incoming kindergarten class.
7-4. Students find coherence across teachers, grades, subject areas, and other boundaries that may exist in the school.	In order to make smoother transitions for students at all grades, the teachers and principal are designing observation and planning periods for all teachers to learn about the students they will have in the next school year.

Further Thoughts for Community Inquiry

Educators and others are working together to develop and deepen concept-based guidelines that can be achieved through a variety of learning experiences. Practices such as whole language, phonics, and cooperative

learning become part of a repertoire of approaches that educators can draw on to assist students in their progress and mastery. No one practice is "the way." The more concepts or benchmarks a particular learning experience incorporates, the more it commends itself as a way for students to spend their time.

School communities are working to be clear about the crucial concepts that should be embodied in the learning activities in which students engage. They are following the work at the national level and interpreting it for their own community context and student needs. They are most aware of the need to deal with potential issues around cultural, linguistic, ethnic, or racial differences as well as other special circumstances their students may encounter. Then, with an understanding of the concepts, skills, and dispositions that they expect their students to master, teachers can craft learning experiences that make sense and accumulate into deep understanding as students move from grade to grade, from teacher to teacher, and from subject area to subject area.

In a school system in Massachusetts, the social studies curriculum came under fire from parents in the community because it was based on textbooks that the school had available but which were outdated and contained few references to the historical contributions of women and people of color. In the course of the debate, teachers and parents working together came up with not only recommendations for new approaches, but also a conceptual focus for the whole K - 6 span.

The guidelines suggested a focus on major concepts, such as similarity and difference, change, conflict, communication, work, food, size and scale, and power, to name a few. Teachers in the elementary school then met to decide how to approach each of these concepts at each grade level. They did this by choosing themes that they would use to organize the conceptual material, such as "me and my family" for kindergarten, "cities" for third grade, and "colonial Massachusetts" (including substantial study of Native Americans) for fourth graders. The teachers developed outcome statements, or statements of attainment, for each grade and its particular thematic focus for each concept from the K - 6 guidelines. Those then could be used as a framework to organize learning activities.

Characteristic Eight: New definitions of responsibility and accountability unite young people and adults in continuous improvement based on rigorous standards.

Indicators	Vignette
8-1. Failures, glitches, problems, breakdowns are analyzed to identify all the factors in the system that contribute, rather than pinning blame on one person, organization, structure, or activity.	After several years of increasingly time-consuming and disruptive behavior problems, the students and teachers at a Vermont elementary school developed a code of "Rights and Responsibilities" that now hangs in every classroom in the school.
8-2. Educators, parents, students, and other community members build and nurture a climate of trust.	A major tenet of the code is that all people in the school deserve respect and a safe, supportive environment. The school has asked parents to support the code through their interactions at home.
8-3. From the time they enter school, students work at becoming self-managing learners, with instruction, encouragement, and coaching from teachers and other adults.	The development process took several months and included everyone in the school in discussions, visioning, and creating concrete examples of how the code would be enacted by each person, what consequences of breaking the code would be, and who would be responsible for delivering those consequences.
8-4. Schools operate as learning communities, with staff regarded as permanent members; ideally, funding arrangements ensure that enrollment fluctuations do not cause staff to be caught in a "revolving door."	The process also revealed questions that teachers and students had about the meaning of respect: How does respect for all translate to classroom practice? How can we value the differences among learners?
8-5. Students, teachers, parents, and others acknowledge that successful learning is earned through effort; they do not attribute success to innate ability.	One commitment that came out of the sessions was a belief in the ability of all students to learn. Students and teachers imagined what ideal learning settings would be like and began to build agreements about what should be standards for all students and what could vary among students.
8-6. Quality is ensured through feedback – continuous assessment and evaluation – rather than only through control mechanisms such as standardized "treatment" (i.e., everyone having the same learning experience), direct supervision of work, etc.	

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Indicators *(continued)*	Vignette *(continued)*
8-7. Students, teachers, parents, and others share a picture of where students should be in their development and where they are now. Assessing, gathering evidence of learning, and then making judgments according to explicit standards is ongoing.	There was widespread agreement among students and teachers that students know what is expected of them and assume more responsibility for their behavior and learning, that they think more about their own behavior, mediate problems among themselves, and ask adults to intervene when necessary. Everyone has more time and energy to focus on the real work of school – learning.
8-8. Unions of teachers and other personnel actively work on quality issues, while managers concern themselves with job security and good salaries, reversing traditional roles.	The principal says that the buy-in by everyone in the school has relieved her from being the sole champion of responsible behavior. Her interactions with students are more positive, and she has more time for instructional and administrative tasks.
8-9. Ongoing discussion, negotiation, and agreement among teachers within a school, across schools within a district, across districts, and so on, establish and maintain a consensus about what counts as quality work.	The students and adults in the building are considering making a proposal to the district about developing a districtwide code of rights and responsibilities so that there are consistent messages about standards for behavior and work.

Further Thoughts for Community Inquiry

Darling-Hammond (1993) best sums up the issue of accountability when she says that:

> *The foundation of genuine accountability . . . is the capacity of individual schools: 1) to organize themselves to prevent students from falling through the cracks, 2) to create means for continual collegial inquiry (in which hard questions are posed regarding what needs to change in order for individuals and groups of students to succeed), and 3) to use authority responsibly to make the changes necessary (760).*

Those who are used to viewing responsibility and accountability as educators delivering instructional services in specific ways, e.g., teacher covering a textbook, using certain instructional strategies, and grading according to a set procedure, may find these new views discomforting. They may ask how can there be accountability if teachers are following where students' questions lead [what Wiggins (1989c) refers to as "intellectual freedom"], rather than a prescribed curriculum. How can there be enough consistency in what students are taught to ensure that they learn what the community decided they want all students to know and be able to do?

There are no simple answers to these questions. It is not an either/or situation, but rather an issue that communities must struggle with in order to find a balance. The freedom of teachers and students to create the curriculum has to be within a framework for student learning and growth. The framework has to provide enough guidance to teachers in their choices of curriculum and instructional strategies, and provide a measure of accountability to teachers, students, and the community around student learning. Different forms of assessment have to provide many ways of looking at how learning is occurring and with what results – for a given activity or project, and cumulatively, over time. There are no surprises when there is ongoing triangulation – communication, alignment, negotiation, and agreement – among perspectives.

Characteristic Nine: The language, cultural, ethnic, and racial diversity represented in the school becomes the cornerstone upon which learning opportunities are sought and offered to all children and adults.

Indicators

9-1. Schools are facilitators of intercultural understanding – within the school, among groups of teachers, among students, and among teachers and students. Schools are also models for developing intercultural understanding within the community. They have a key role in including everyone in the learning and socializing process.

Vignette

In response to the increasing influx of Spanish-speaking children into their district, the staff and parents of a Massachusetts elementary school began rethinking teaching, learning, and assessment practices in their school setting. What began as a search for curriculum and strategies that targeted the needs of a particular linguistically and culturally different population of students became the vehicle of reflection for the way the school was organized, how roles were designated, and what was at the core of what all children needed to know and be able to do in a pluralistic world. As a result, an expanded definition of learners and learning began to emerge, and new roles for teachers, parents, and students were contemplated.

New considerations of the role language plays in the learning/teaching domain began to drive the design of new learning situations. The school looked into redesigning learning opportunities where all students, not only those whose language was not English, could become bilingual and bicultural. A group of staff members and parents representing the diversity within the community volunteered to design the first phase of a developmental bilingual program. To them, this meant a program where all participants learned in two languages. They believed that the new

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Indicators *(continued)*	Vignette *(continued)*
9-2. Educators become learners in the process of creating and assessing a learning environment that is inclusive and builds on and responds to the presence of different ethnic and linguistic backgrounds in the school and community. }	language and culture the students brought could become a viable resource in expanding learning and teaching in their school. They began by identifying gaps in their knowledge base and searching for answers. Research and proven practices regarding second-language acquisition, culture and learning styles, bilingual development, and communication began to inform their program design. New knowledge became the content for discussion groups, staff development opportunities, and research projects with the broader staff. Kindergarten students who spoke only Spanish or English were considered for the program. This way all students entered the learning situation with the same strengths and weaknesses. Each linguistic group began acquiring literacy skills in their own language while interacting socially with the other language group. This social interaction provided a natural setting for learning to communicate using a different language. First-grade students spent most of the time developing their literacy skills in their native language in a homogeneous setting while beginning to explore the second-language in more formal ways — in a second-language format or in a mixed group where native speakers of the second language became peer tutors.
9-3. Support systems that promote the creation of structures and designs that center on the unique needs of the second-language learner are in place. Staff development topics around issues of second-language acquisition and cross-cultural understanding are promoted systemwide. }	Jane and Emilia were fourth-grade teachers in this two-way bilingual program. Jane spoke only English, while Emilia was fluent in both Spanish and English. They met regularly after school to discuss progress and jointly design lessons. Their curriculum delivery was carefully orchestrated to maximize the learning experiences for students. Second-language acquisition techniques were built into the design. The role culture plays in the cognitive development of students was often the focus of their attention, study, and sharing with parents. Thematic units were designed with the understanding that they were teaching students with different languages. Content of the lessons was taught in both languages. Emilia taught math in Spanish while Jane taught science in English. *(continued)*

Indicators *(continued)*	Vignette *(continued)*
	Half of the students taking math were native English speakers – for the rest, Spanish was their native language. Cooperative-learning groups provided opportunities for native speakers to become become peer tutors. Because Jane and Emilia worked together so much, they were able to discuss topics that were often difficult to confront, like perceptions of cultural groups, difficulties with helping minority parents, adjustments of their children in a majority culture, and others that were less well defined. In this way, they tried out with each other strategies they could use to help them be a culture mediator for their students and their families.
9-4. The school builds on the strengths of each group to expand their sense of belonging to a learning community. }	A "buddy system" where English-speaking parents were paired with Spanish-speaking parents to attend school meetings and functions increased the number of parents who came and were involved. In addition, the school offered Spanish as a second-language to English-speaking parents and community members and English as a second language to those who were proficient only in Spanish. In addition, these two adult language classes had been involved in writing instructions for publishing children's stories for the classrooms in each language. Through their joint work, English-speaking and Spanish-speaking parents got to know each other. Several parents whose children had become friends had themselves become acquainted. One English-speaking parent invited her son's best friend's parents, who spoke only Spanish, to share the PTO room representative role with her.

Further Thoughts for Community Inquiry

Successful enactment of Characteristic Nine depends on a full definition and candid assessment of the diversity represented in the school community. While the above vignette builds upon a specific example of diversity – linguistic and cultural – there are many other types of diversity and each type, as well as combinations of these types, must be treated carefully. In some school settings there are multiple identifiable cultural, racial, or language groups. In other settings, one group predominates, and

whether the majority group in the school is historically and numerically a minority in the overall population is a significant factor. Other settings have an outward, misleading appearance of homogeneity. Each kind of school setting presents a unique challenge for truly building upon, or introducing, diversity in ways that help everyone at the school learn and grow. Too often shallow treatment of surface aspects such as dress, food, and holidays pass for "multicultural" approaches. While such tangibles can offer entrance to explore different cultures and groups, deeper issues of background, experience, and values take much more time and effort to fully explore and use.

In meeting the goal of helping students understand and know how to live in a multicultural, multiracial, interdependent world, those schools whose populations are not diverse are faced with the vital task of structuring the learning environment in a way that enables students to explore and value the diversity of our world in real ways.

Returning, for a moment, to those settings where cultural and linguist diversity predominate, there are a number of approaches which need to be examined from the vantage point of their effectiveness at integrating learning, teaching, and assessing.

> *Addressing the needs of culturally and linguistically different students is a recurring challenge for many schools around the country. Demographic projections forecast that half of all American teachers teach non-English- speaking or limited-English-speaking students at some point in their careers (O'Malley and Waggoner 1984).*

Many school districts around the country have responded to the needs of these students with special or "compensatory" programs (i.e., English as a Second Language or Transitional Bilingual Education) that stress the need to become proficient in English in two or three years despite research findings indicating that learning a second language for academic purposes takes from five to seven years or longer (Collier 1987, Cummins 1981). These programs operate from a deficit or "subtractive" (Lambert 1975) assumption, suggesting that the education of language minority students can best be achieved through the substitution of one language for another by either teaching content instruction in English or by teaching content instruction through the native language until the student has enough proficiency in English to sustain academic instruction.

The relatively low success rate of these initiatives has been the subject of much controversy in the education community. Some argue that implementing programs that ignore the developmental aspects of acquiring second language are doomed to fail. In addition, there are social and emotional factors that need to be dealt with in a sensitive manner for those who are being asked to give up their primary language for English. Others conjecture that the failure of many bilingual and culturally diverse students is really related to socioeconomic factors that are beyond the control of schools. Both positions converge in that the present situation of

educational initiatives for students whose culture, language, and consequently communicative and learning styles are not reaping maximum outcomes. All agree, however, that many language education initiatives are failing despite common agreement on the cause.

Some linguists suggest that an "additive" (Lambert 1975, Cummins 1986) approach to program design yields substantially better outcomes for language minority students as well as native English speakers. Essentially, this position is that instead of taking away languages other than English and substituting English, you combine two linguistic groups and have them learn each other's language to be as fluent as possible. This approach advocates that language learning and cultural enhancement are resources (Soto 1991). Student outcomes are also enhanced in that children in these programs outperform non-bilingual program students on a variety of standardized measures. The presence of another language and culture in the school community can become a tool of enhancement and enrichment that optimizes educational opportunities for all students.

To understand better the success rate of these practices, we must examine how they integrate teaching, learning, and assessment. What makes these learning environments so constructive? What do teachers need to know about student learning and prior knowledge as it applies to all students, but especially those who come from a culturally/linguistically different background?

There are three areas to explore to begin to answer these questions:

- Developing culturally responsive environments: Environments that build on the students background knowledge or cultural orientation will be more conducive to learning.

- Understanding that knowing more than one language promotes cognitive development: Research shows that advanced bilingualism is associated with cognitive flexibility and divergent thinking, both of which correlate to higher levels of cognition (Hakuta 1986). Attitudes and understandings about the benefits of learning a second language can become more positive when this information is known and used.

- Examining instructional practices with higher success: Cooperative learning, whole-language instruction, and high expectations for all students are components of the approach described in the vignette. These practices are useful for all children and in particular, facilitate higher levels of learning in children whose first language is something other than English.

As we have stated before, teachers need to continue to become learners around the issues, especially ones around language, ethnicity, culture, or race. In doing so, they can create an environment where teaching, learning, and assessing are interwoven.

Summary

The dominant message of this chapter is that integrating learning, teaching, and assessing means getting beyond either-or thinking to find the common ground. For example, it's not whether the teacher is in charge or the student is in charge or the parents are, but determining how to share the responsibility for education that's important. That common ground is not a final destination, but rather an ongoing series of negotiations, of successive approximations that have no end point. As Kanter (1983) has observed, once an individual or organization has reframed to think in terms of opportunities for growth and continuous development, there are no established limits. These redefinitions, ongoing negotiations, and continuing tensions are everybody's. In change that truly involves the whole system, everyone learns and changes. We must negotiate among ourselves the standards we desire for young people, continually revisiting what counts as quality, and establishing an appropriate pace for the long haul. When change, learning, and improvement are constants, there is no final "there," only the getting there.

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The Journey

Introduction: An oral history is an excellent way to capture a valuable perspective about the past. Often, important information is lost because it is not recorded. In a school system, for instance, the only records may be notes of meetings sanitized for the official record. The Journey is a way for teams to record events of the past in a visual or graphic way. In addition to being a creative way to track past activities and events, it is a valuable planning tool, especially for anyone who wants to avoid "reinventing the wheel."

Purpose: A journey can be developed for several purposes, among them to:

- identify key events, milestones, factors, and influences that have been important over time;
- develop a shared sense of history among a group of people;
- honor how far a person, group, or organization has come and serve as a basis for celebration;
- orient new staff among their colleagues;
- foster an awareness of developments over time in newcomers and outsiders;
- activate prior knowledge and experience in order to begin making connections to new work and next steps – to set current activities into context;
- allow a person, group, or organization to explain to others what has happened;
- use a more "right-brained" approach to complement the "left-brained" production of text; and
- document and reflect on change, development, and learning.

Both the process and the product of journey development foster reflection.

Materials: Enough copies of the Narragansett Elementary School journey (see pages 128-130) for each participant, newsprint, easels, markers, masking tape, clear tape, Post-Its, and pens or pencils.

Leader's Notes: A "journey" is a drawing, map, or other representation that answers the question, How have you gotten where you are today? The focus of the journey may be at any level – community, organization, or individual. Every journey has a framing question: it may be about the development of a program, the changes in a school, the work that has been undertaken to become a learner- and learning-centered district, etc. For an individual, an example of a framing question might be, How have you developed as a teacher using authentic assessment?

Source: *Work in Progress: Restructuring in Ten Maine Schools* by Pat L. Cox and Jane deFrees. The Regional Laboratory for Educational Improvement of the Northeast and Islands and the Maine Department of Education. ©1991.

The journey technique is loosely based on "casual mapping" methodology developed by qualitative researchers to depict and explain the relationships among key variables in a study (Miles and Huberman 1984).

Use the following questions to guide the participants through a journey:

Process/Steps:

1. **What is your purpose?** Decide the purpose(s) for your journey and how developing the journey fits into ongoing work. For example, if you want to learn about a particular program, do you want to focus on the program's journey or how the program fits into the overall journey of your organization? For example, in telling the story of the Maine State Restructuring Program, participants focused on the journeys of ten schools over time where the restructuring effort fit into the development of the schools (see the journey from the Narragansett Elementary School in Maine on pages 128-130). When staff from schools in Vermont reviewed the journeys, they said that it was the first time they felt that schools had been honored for their own history rather than being viewed piecemeal through program-centered documentation.

   Think ahead about what should happen with the journeys – that is, is this a "one-shot deal" just to try it out? Do you foresee needing to reproduce it in some way? Do you want to disseminate it, e.g., hang it up, etc.? We have found that people are often initially reluctant to engage in a "drawing" activity but later discover that what they have created is special and that they want to do further work on it.

2. **Who creates the journey?** Journeys have been developed by individuals, pairs, small and large teams, and whole organizations. In developing journeys with others, participants find that no one person has all the information about what has happened over time. Having newcomers helps those who have been around for a while "tell the story" that many may take for granted.

3. **How do people create journeys?** People can create journeys on any size sheet of paper, but if a group is doing the work and the journey is to be displayed, working on one or more sheets of newsprint is helpful. To help people overcome the tyranny of a blank sheet of paper, we have found that using different-sized Post-Its helps them write down important events, influences, etc., while still enabling them to rearrange the pattern and flow as new ideas come to mind. Post-Its also allow several people to contribute at the same time. Remember to tape the Post-Its down with clear tape when you're done so they don't flutter away when displayed or moved.

   One of the trade-offs of using newsprint, which is usually about 2' x 3' rather than 8-1/2" x 11" or 11" x 14", is that reproducing the journey for distribution becomes a hassle. The choices are transcription, copying the journey onto smaller pieces of paper, or using a blueprint copier, which is currently available at many copying outlets. We found one machine that would create an 11" x 14" copy from a couple of newsprint sheets!

   Journeys can also be created through interviews, in which a person not involved in the effort asks one or more participants to tell the story. The rough draft, created by the interviewer, can then be revised and/or elaborated by the interviewees. A draft journey can also be created from a review of documents.

4. **What questions should be asked to shape the journey?** First, set the stage for the activity: Determine the framing question for the journey. Given the frame, acknowledge that individuals or others (teams, organizations, programs, state) have been around for a while and that many things have happened over time. Even if individuals are new, there have been many activities, decisions, and events that have occurred.

Invite participants to begin their journeys, asking them to consider some or all of the following questions: When did the journey begin? What are the key events or milestones that have brought us to where we are now? (Remember to include the good, the bad, and the ugly.) What obstacles have we overcome? What support have we had? What influences, positive and negative, have there been? What have been accomplishments and setbacks? You can use symbols to demarcate different aspects of the journey, for example:

▲ = Changes, ◯ = Processes, and □ = Events.

Encourage the journey developers to note where they lack information or have questions to ask others. The journey may be a work-in-progress that people may want to update occasionally. When a team develops a journey away from the rest of the school or the organization, members often want to return home and make an opportunity for colleagues to create a whole-organization journey, rather than bring home a product created by a few individuals.

5. **What questions should be asked to reflect on during the journey?** We have used a variety of "lenses," or questions, to reflect on during journeys. Here are a few options:

   - First, look over the journey and recognize how much you have accomplished and handled over time. People who are in the thick of things and focused on how much there is yet to do rarely give themselves or one another credit for all the hard work.

   - Stand back and ask yourselves if there are major areas or stages that the journey divides itself into. For example, staff from one city school district realized that their journey of 25 years could be divided into three areas: 1) when the district was highly reactive (not to mention defensive), 2) when the district set about becoming proactive and self-determining, and 3) when the self-determination that had resulted in high centralization was being spread throughout the district.

   - Look at the journey and ask, What have we learned as a result of all this? What does that mean for our future?

   - Review the journey by asking these questions: What's different for clients (students and others) as a result of all this? What's different for staff? What's different about the structure and operation of the organization? What connections have been made – with the community and other organizations? What questions are we asking now?

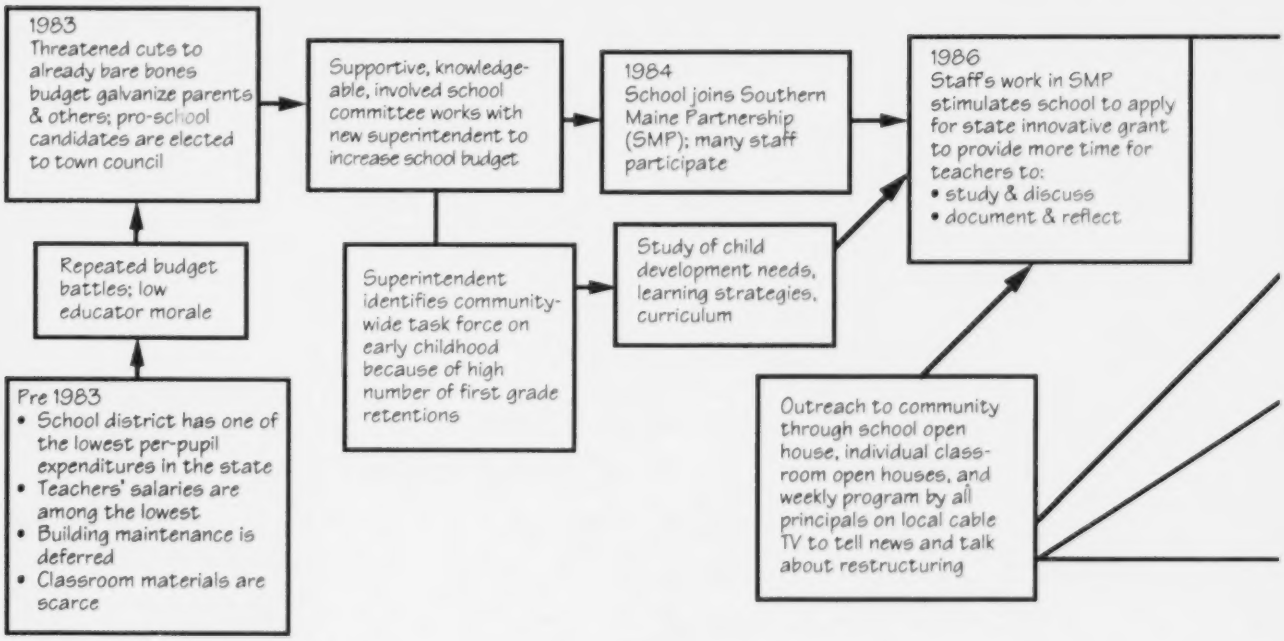
   - You can also use one of a number of conceptual frameworks to reflect on or analyze your journey. For example, the CaMaPe framework of models of school organization (Petri and Burkhardt 1992) or the CBAM change frameworks (Hord et al. 1987) may be appropriate.

Time Required: It depends on the purpose and how many are involved. An individual reflecting on an experience can create a journey in 20 minutes. Having a team or larger group develop a journey requires time for the group to orient themselves to the task, then to talk as they build the journey, and finally to reflect on its meaning. In addition, when a number of individuals or teams are working on different journeys, people want to share their journeys and insights from creating them. Small teams can complete a rough journey in 45 minutes, but that leaves little or no time for reflection. We recommend one hour for journey creation and one half hour for reflection, followed by sharing-out time as appropriate.

NARRAGANSETT ELEMENTARY SCHOOL: *"Becoming a center of inquiry"*

Narragansett Elementary School is located in Gorham, on the outskirts of Portland, Maine's largest city. It is one of six schools in a K–12 school district serving about 2000 students. The population in Gorham is growing rapidly. Until 1990, Narragansett had 580 students enrolled in grades K–3. The formation of a Kindergarten Center in another building in 1990 reduced the number of students at the school to 430, grades 1–3. Narragansett is one of two schools in the district receiving state restructuring grant funds, the other being Gorham High School. The school district has a long history of school improvement efforts. Gorham is also the location of the University of Southern Maine (USM), which has a strong education program. Narragansett has found the USM-sponsored Southern Maine Partnership, a network of schools engaged in questioning their practices, to be an invaluable vehicle for inquiry and exchange of ideas. In the same spirit that businesses fund R&D to keep their organizations at the cutting edge, Narragansett has used some of its restructuring grant to fund a position devoted to connecting the staff with research: "If we're going to be a center of inquiry, we have to go, think, do, and have access to information — and that takes money." At the same time, the Narragansett staff is acting on the realization that, to continue change over the long haul means that there must be a "community of leaders," with leaders coming forward as needed and then moving back to let others lead: "Nothing meaningful happens if only one person carries it."

NARRAGANSETT ELEMENTARY SCHOOL'S JOURNEY


1983
Threatened cuts to already bare bones budget galvanize parents & others; pro-school candidates are elected to town council
Supportive, knowledgeable, involved school committee works with new superintendent to increase school budget
1984
School joins Southern Maine Partnership (SMP); many staff participate
1986
Staff's work in SMP stimulates school to apply for state innovative grant to provide more time for teachers to:
• study & discuss
• document & reflect
Repeated budget battles; low educator morale
Superintendent identifies community-wide task force on early childhood because of high number of first grade retentions
Study of child development needs, learning strategies, curriculum
Pre 1983
• School district has one of the lowest per-pupil expenditures in the state
• Teachers' salaries are among the lowest
• Building maintenance is deferred
• Classroom materials are scarce
Outreach to community through school open house, individual classroom open houses, and weekly program by all principals on local cable TV to tell news and talk about restructuring

WHAT'S BEEN HAPPENING AT NARRAGANSETT ELEMENTARY SCHOOL

1. WHAT'S DIFFERENT FOR STUDENTS?

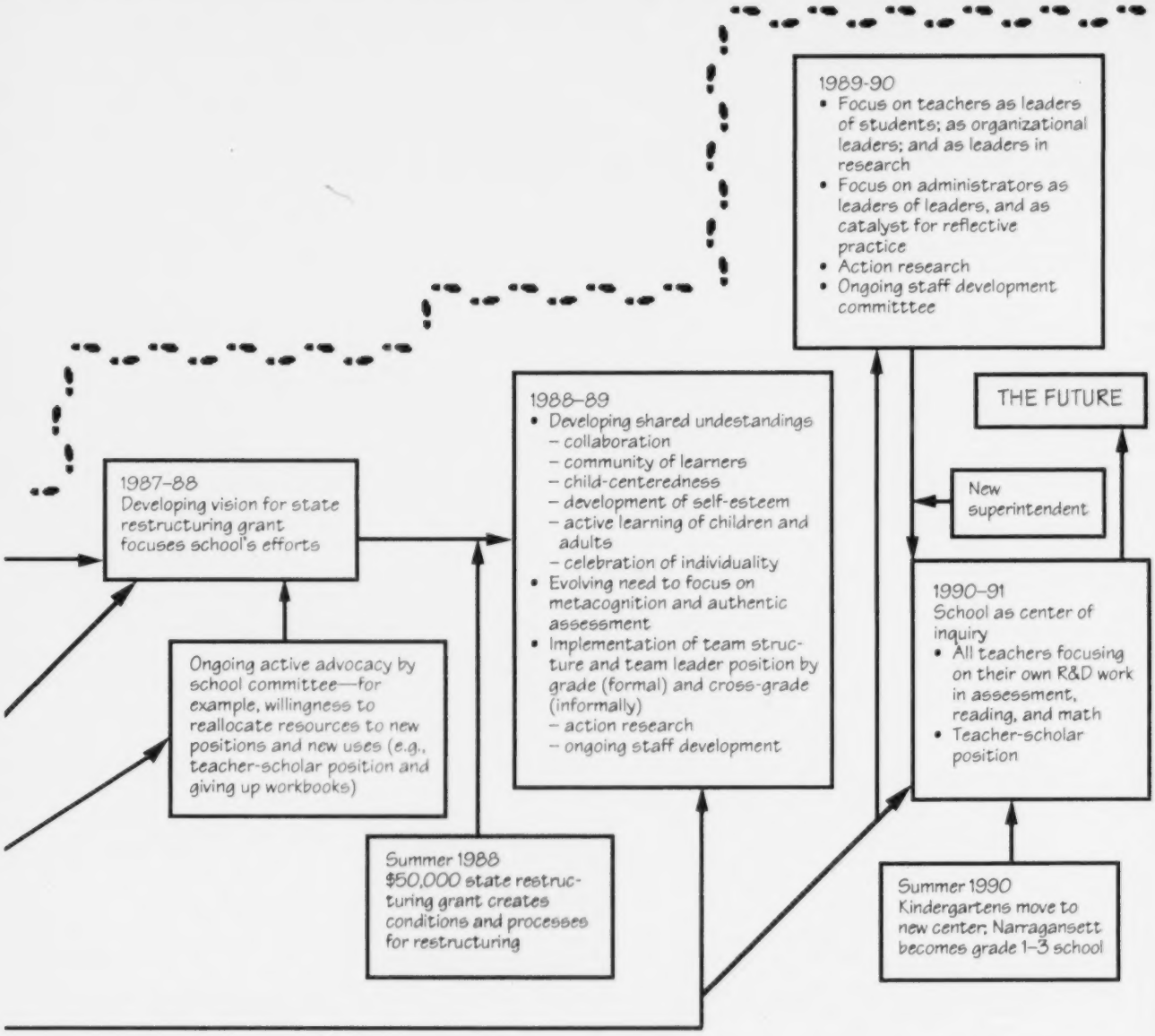
All kids:

- have an opportunity for success as active learners
- learn in variety of ways with a variety of materials
- are appreciated for their developmental stages and differences

All kids (continued):

- feel safe and successful in school
- see inquiry being respected and modeled
- have choices and involvement in the learning process
- are empowered with skills and treated with dignity
- are taught to think about, talk about, and assess their own learning process

Source: Cox and deFrees, 125: 8-10.


1989-90
• Focus on teachers as leaders of students; as organizational leaders; and as leaders in research
• Focus on administrators as leaders of leaders, and as catalyst for reflective practice
• Action research
• Ongoing staff development committtee
THE FUTURE
1988–89
• Developing shared undestandings
– collaboration
– community of learners
– child-centeredness
– development of self-esteem
– active learning of children and adults
– celebration of individuality
• Evolving need to focus on metacognition and authentic assessment
• Implementation of team structure and team leader position by grade (formal) and cross-grade (informally)
– action research
– ongoing staff development
New superintendent
1987–88
Developing vision for state restructuring grant focuses school's efforts
1990–91
School as center of inquiry
• All teachers focusing on their own R&D work in assessment, reading, and math
• Teacher-scholar position
Ongoing active advocacy by school committee—for example, willingness to reallocate resources to new positions and new uses (e.g., teacher-scholar position and giving up workbooks)
Summer 1988
$50,000 state restructuring grant creates conditions and processes for restructuring
Summer 1990
Kindergartens move to new center; Narragansett becomes grade 1–3 school

2. WHAT'S DIFFERENT ABOUT TEACHING AND LEARNING?

Teachers:

- are reflective practitioners modeling inquiry
- have as a key question "how is this child smart?"
- trust one another so all can succeed in his/her own style of teaching
- have the opportunity to try new programs and practices
- engage in cross-grade-level teaching
- team both within and across grade levels

Teachers (continued):

- have the opportunity to stay with same students for two years
- develop curriculum using children's prior knowledge and curiosity
- have the opportunity to study and to conduct research projects
- use more child-centered assessment approaches
- are working with a district technology specialist to develop a cumulative portfolio assessment system K–12 that uses multiple media (video, document scanners, audio recorders) to record student progress

WHAT'S BEEN HAPPENING AT NARRAGANSETT ELEMENTARY SCHOOL (continued)

3. WHAT'S DIFFERENT ABOUT THE ORGANIZATION AND OPERATION OF THE SCHOOL?

The school is organized to provide:

- team leader positions for teachers
- time for teachers to work with and observe colleagues and children at all grade levels
- professional development for all faculty, through which staff learnings have led to a "common language" in which to discuss education
- services to students in the classroom rather than in separate programs, e.g., students with disabilities are mainstreamed
- paraprofessional help in every classroom
- clerical assistance to dignify student work through "publishing" and other preparation of materials and to allow teachers more time to listen to children
- the opportunity for the principal to make facilitation of change an ongoing part of her role
- the position of teacher-scholar, which funds one staff member fulltime for a year to engage in intensive study and to assist colleagues in gathering information, developing and sharing research

4. WHAT CONNECTIONS ARE BEING BUILT?

Within the school district:

- working with the computer coordinator at the junior high to develop multi-media assessment portfolio
- strong support from superintendent
- the high school is involved in its own restructuring project
- the other primary school in the district is creating its own restructuring vision

With parents and community:

- parents work with teachers to place students in the appropriate learning settings
- parent volunteers are active in the school
- community television network features weekly reports from principals and scenes at the schools

With assistance resources:

- membership in Southern Maine Partnership with the University of Southern Maine "taught us to think and not to be complacent"
- networking with other schools engaged in restructuring

5. WHAT QUESTIONS ARE BEING ASKED?

- How does a restructuring school link with other schools in the same district?
- How does one share a changing school culture to keep the restructuring going?
- How does one find the funding from the local school budget to continue the initiatives?
- Looking into metacognition: how do kids perceive themselves and their learnings and what strategies do we give them about how they think?
- How do we know what is important to teach and how do we assess that?

Powerful Learning Experience

Introduction: Whether you call it an "aha" experience or the moment when "the light goes on," everyone has had learning experiences that are memorable. They are significant because they represent true understanding or learning. Often these experiences occur when new information connects to something we already know and understand. The Powerful Learning Experience guides participants in an activity that helps them understand what a true learning experience is. The results should spark ideas for rethinking how students learn.

Understanding how and when learning takes place is at the core of improving education for all students. This activity calls on both adults and students to explore their own personal attitudes about learning, and inspires insights about new possibilities for learning inside the classroom as well as at home and at play. It conveys the message that we must all take responsibility for our own learning.

Purpose: To challenge teachers, parents, administrators, students, and community members to think about learning in new and different ways. This activity and the Suggested Next Steps (see page 133) ask participants to explore their own conceptions of learning and urges them to think freely and creatively about how schools can deepen understanding for all students.

Materials: Enough copies of Learning Principles (see page 135) for each participant, newsprint, easels, markers, masking tape, blank paper, and pens or pencils.

Leader's Notes: This is a two-step activity with both individual and group work.

[Note: Wherever we've used the Powerful Learning Experience, only about 25 percent of the experiences have been school-related.]

Process/Steps:

Working Individually . . .

1. Ask participants to think of a learning experience in their life that was powerful and had some impact on them. It could be an experience from school or any aspect of life. It could be something that happened recently or many years ago. It could be positive or negative. Each participant should identify an experience that was powerful for them.

2. Now, ask them to try to recall the experience vividly. You might say, "Relax. Take a deep breath. Close your eyes. Remember . . . what does the experience feel like? . . . look like? What do you smell? . . . taste? What sounds do you hear? Where are you now? Who's with you?" Have them think of as much detail as possible to truly bring the experience back into focus.

3. Once they have recalled the experience vividly, ask them to describe it on paper. These notes are not to be shared. Have them answer the following questions: What was the experience? Who and what was involved? Why do you consider it a powerful learning experience?

Working with a Partner . . .

1. Ask participants to take turns sharing their experience and some of their thoughts about it.

2. Ask each pair to reflect on the experiences and discussion. How do they compare to each other? Have them find some characteristics that seem common to both experiences, or characteristics that they think may be somewhat generic to the learning experiences that people feel have a powerful impact on their lives. Have them jot these down together.

3. As a whole group, talk briefly about the settings or contexts of the powerful learning experiences. Make a quick list of the settings on newsprint – don't tell the individual stories. How many happened in school? How many happened elsewhere?

4. Ask participants to share the characteristics of learning they found when working in pairs by having one person list them on newsprint and then having both take turns contributing characteristics. Be specific, listing the connections, conditions, the environment, and resources available.

5. Discuss how school promotes learning with these characteristics. Do all children experience this kind of learning on a regular basis? Do the adults who work with them experience this kind of learning on a regular basis?

Time Required: 30 minutes

Powerful Learning Experience: Suggested Next Steps for Faculty and Staff, Students, and Parents

For Faculty and Staff:

Purpose: The goal is to have teachers and administrators think about learning in new and expanded ways and to identify strategies that will promote increased student learning.

Suggested Activities:

1. After completing the Powerful Learning Experience, have individuals concentrate on personal experiences and ask them to keep a log of these experiences to reflect on over the next few months.

2. Research supports the idea that student learning increases in schools and classrooms where students feel safe, where they are free to experiment and make mistakes without fear of ridicule or failure, where there is a sense of predictability (they know what is expected of them, where materials and resources are, etc.), and where they know how to get what they need to get their work done. Consider how your school and classroom rates now and make suggestions for improvements.

3. Using the Learning Principles (see page 135), consider each characteristic and develop strategies for including them in the curriculum, climate, and policies of the school. One way to begin might be to have all staff watch the video *Stand and Deliver* or the Peabody Award-winning film, *Good Morning, Miss Toliver [available from Fase Productions, 4801 Wilshire Blvd., Los Angeles, CA 90010 for $19.95 (800-888-0600)]* and analyze the learning strategies used by Jaime Escalante and Kay Toliver. Consider other stories from literature, historical or present, where characters had powerful learning experiences or where significant learning took place and then analyze them.

4. Involve faculty in workshops on multiple intelligences and/or learning styles and discuss ways these learning principles intersect with the Powerful Learning Experience.

For Students:

Purpose: The goal is to encourage students to develop responsibility for their own learning. The Powerful Learning Experience is one way to begin this process.

Suggested Activities:

1. *Self-Evaluation:*

   - Have students think about when they learn best, for example, "What did I learn today from the science experiment? Why didn't I learn much?" (Watch for gender differences: Boys often attribute low performance to lack of effort or to an unfair test; girls often think it's because "I'm just not good at science.") Have students keep a journal or log of times they learn best. After completing an assignment or project, ask them to reflect on these questions: What would you do differently next time? Did you use resources wisely? Did you seek help? and Did you use feedback effectively?

2. *Thinking Skills:*

   - Ask students to analyze how they conceived a project or assignment. Did they take the first idea or try out a few ideas? What did they do that made the project easy or difficult? Did they establish goals for themselves? Did they ask if they didn't understand? Did they stand up for what they believed?

3. *Creativity:*

   - Ask students to analyze the amount of creativity that went into a project or assignment. Did they challenge themselves or hang in there when it was hard? Did they look for new ways to do things? How involved did they get? Did they get excited about the work? If not, why? How many different intelligences did they use?

For Parents:

Purpose: The goal is to have parents understand their own concept of learning and to identify ways to support their children's learning.

Suggested Activities:

1. After completing the Powerful Learning Experience, ask participants to focus on personal experiences. What do you consider learning? Some people think of learning as the memorization of facts; others think of it as self-discovery. Ask parents to reflect on how our experiences help or hinder our children. What do they want for their child? What are their expectations from the school?

   - When did your children begin to learn? What did they learn from play? . . . from school? . . . from family? What messages do you communicate to your children about learning? Do you make it sound easy? . . . difficult? Is it limited to school or does it happen throughout your child's day?

   - If you had to predict what your child would report as a powerful learning experience, what would it be?

   - How can you create powerful learning experiences at home? Think of a few examples.

   - How can you turn a bad experience into something positive? If your child has a negative powerful learning experience, what can you do about it?

Learning Principles

Much is known about how we learn, from research, practice, and common sense. In an attempt to translate the extensive body of knowledge on the topic into a useful format for educators, parents, community members, and students, the Laboratory has developed 12 Learning Principles. This list is not intended to be comprehensive, rather it is our attempt to articulate the critical aspects of learning based on our understanding of the research, our extensive experience in schools and classrooms, and our own personal experiences.

1. People are born learners.
2. People seek to understand new information and experiences by connecting them to what they already know.
3. People learn in different ways.
4. Thinking about one's own thinking improves performance and the ability to work independently.
5. Individuals' stages of development affect learning.
6. Although people may naturally make connections as they learn, they often need help to transfer knowledge to different contexts.
7. A repertoire of strategies enhances learning.
8. Certain dispositions, attitudes, and habits of mind facilitate learning.
9. Working with others of different styles and perspectives enhances learning.
10. Those who do the work do the learning.
11. A resource-rich environment facilitates learning.
12. Developing shared understandings about what constitutes quality work fosters learning.

Four Corners Activity

Introduction: "Do I mean what I say?" "Do I say what I mean?" For many people, the answer is "not always." The objective of this activity is to get underneath what participants are saying about learning and help them articulate for themselves their own strongly held beliefs. Only when we confront our beliefs about learning and education can we work toward a shared vision for change in our schools.

Purpose: This activity helps participants clarify their beliefs and assumptions about issues their group is confronting. This is not a consensus-building activity; rather, it is a provocative way to get people to think about what they believe in, articulate those beliefs, and discuss them. The result should be a stimulating and lively debate on a topic of mutual interest and concern.

Materials: Newsprint, easel, markers, masking tape, and signs that indicate level of agreement (see Step 2 below).

Leader's Notes: The key to designing this activity is to develop statements that focus on one topic or set of issues that is "provocative" enough to force participants to take a stand. It should also be as ambiguous as possible, allowing for different interpretations.

Examples of statements are:

- Standardized tests have no redeeming value.
- Students should not be placed in homogeneous groups.
- Teachers do not have the training or knowledge to use authentic assessment methods.
- All students are capable of assessing their work.
- Different assessment methods should be used with different students.

Sometimes people are persuaded to change their views upon hearing the arguments of others. Often people are frustrated by having to choose a single corner because their actual belief may be that sometimes the statement is true and sometimes not. Nevertheless, the activity gives people a chance to talk about how they feel and why, and to challenge the beliefs of others. Another strength of the activity is that people physically stand where their beliefs are.

Source: *Building Systems for Professional Growth: An Action Guide* by Margaret A. Arbuckle and Lynn B. Murray. The Regional Laboratory for Educational Improvement of the Northeast and Islands and the Maine Department of Educational and Cultural Services. ©1989.

Process/Steps:

1. Write the statement on a piece of newsprint. Then hang it in the front of the room with the paper folded up so the statement cannot be seen until you are ready to begin.

2. Set the room up with signs in each of the four corners as follows: Agree, Strongly Agree, Disagree, and Strongly Disagree.

3. Show the statement to the group. Ask everyone to stand in the corner that represents how they feel about the statement. Instruct them to base their choice on their interpretation of what the statement means.

4. Ask those in each corner to talk among themselves about how they feel.

5. Next, have a spokesperson from each corner report to the whole group the different reasons why everyone in their group chose that corner. At any time during the process (even during report-out), participants may change their minds and move to a different corner.

Time Required: 1 hour

Changes in My Community

Introduction: A community is as strong as the sum of its parts. One way to strengthen any group is for the members to have a shared understanding of their own history. This activity gets individuals to consider the context in which they are operating and "sets the stage" for changes they are about to plan and implement.

Purpose: To assist individuals and groups in understanding the present, it is often useful to review the past and to plan for the future. This activity paints a local historical perspective that can be discussed in the context of the present local conditions in the schools.

Materials: Enough copies of the Changes in My Community form (see page 140) for all participants, newsprint, easels, masking tape, markers, and pens or pencils. If available, copies of news articles from the local paper from five to ten years ago (these may be available from your local library, historical society, or the Chamber of Commerce).

Leader's Notes: This activity helps people recognize how their community has changed with regard to numerous variables. Once the chart has been completed by individuals or small groups, the whole group should discuss the changes and their implications for the schools. This exercise is ideal for a diverse community group and helps get at the question "Why change?"

Suggested background resources that support this activity include most articles by demographer Harold Hodgkinson, in particular, "The Right Schools for the Right Kids" [*Educational Leadership*, February 1988, 45 (5): 10-14], and the video *Reschooling for the Future: Restructuring American Education* (National Alliance of Business, 1991).

Process/Steps:

1. If the group is large enough (10–12), divide participants into groups of three or four. If possible, each group should have at least one person who has been in the community for at least ten years.

2. Ask each group to fill in a Changes in My Community form with as much detail as possible.

3. Debrief the activity by leading the group in creating one set of information on newsprint. The goal is to arrive at a consensus and to build a shared understanding about events that occurred over the last five to ten years. This should help people understand that every era has its own set of problems and that understanding these problems can help inform why things are the way they are now.

4. Ask the group to brainstorm:

   - What are some of the implications for the people involved — students, teachers, administrators, school board members, parents, and community members — when schools change?

   - How does the community's history impact on learning for all students?

Time Required: 1 hour

Source: Developed by the Council for Educational Development and Research Cross-Laboratory Restructuring Collaborative, Fall 1990.

Changes in My Community

How has my community changed over the past ten years?

Demographic Changes: _____

_____

_____

_____

_____

Economic Changes: _____

_____

_____

_____

_____

Value Changes: _____

_____

_____

_____

_____

Technological Changes: _____

_____

_____

_____

_____

Becoming a Better Learner

Introduction: Learning is highly personal. Like a fingerprint, we all have different and unique modes of learning, or ways we take in and process information. Honoring individual styles of learning is important, but it's only the first step. A second step is to understand the elements of successful learning. This activity guides participants to concrete images of the successful learner.

Purpose: This activity orients parents, teachers, and others to the skills and attitudes that characterize the successful learner. It helps people turn their experiences with and observations of children into concrete goals for learning. It is excellent as a follow-up to the Powerful Learning Experience or as a pre-activity to the Learning Principles (see page 135).

Materials: Enough copies of Learning Principles from Appendix A-2 for each participant, newsprint, easels, markers, and masking tape.

Leader's Notes: In this activity, participants call up "negative" behaviors that get in the way of student learning and then turn these "negatives" into learning goals. By beginning with the negative, you can demonstrate how irritating behaviors may be indications that the classroom environment may not be as conducive to learning as it should be.

The activity can lead to a subsequent discussion of the Learning Principles and the correlations between the two. For example, the behavior "They don't apply what they learn in one place to another" relates to Principle 6, which holds that most children have to be taught to transfer knowledge among different contexts. Or, "They don't listen" could relate to Principles 2, 10, and 11. Perhaps the student isn't listening because the resources in the classroom are not stimulating or they don't understand the context of the lesson. If the example is based on a knowledge of baseball and the student has never played, it may be difficult for them to make the connection. If you choose to discuss the Learning Principles, that is a separate activity.

Process/Steps:

1. Ask participants what their students or their own children do that leads them to think these children could be better thinkers and learners.

2. Divide the newsprint into two columns. Make a list of what people offer in the left column so everyone can see. The list may look something like the one on page 142.

3. Ask participants to turn the undesirable behaviors into desirable ones, or goals, as illustrated in the right column of the sample.

4. Ask participants to review the learning goals. Facilitate a discussion around what is behind these kinds of behaviors and attitudes in children and how learning environments can be designed that teach the behaviors necessary to achieve deep understanding.

Time Required: 30 minutes

Source: Adapted with permission of the author from "Restructuring Lesson Plans to Enhance Thinking" by Arthur L. Costa. Presentation at California State University, Sacramento, Summer 1991.

CHILDREN DO THAT MAKES US THINK THEY NEED TO BE THINKERS AND LEARNERS	LEARNING GOALS FOR BECOMING A BETTER LEARNER
1. They look to me for too much guidance. When I give directions that have many steps, they do one, then come up and ask for help, then do another, ask for help, etc.	Students can follow complex directions. They see the task as a whole and understand what the standards are for the task's completion. They ask questions about the instructions before beginning the task and try to solve their own problems during the task.
2. They don't take initiative about their own learning. They wait for me to suggest things to do.	
3. They are too "right answer" oriented or teacher oriented.	
4. They don't like to take risks or experiment with new things.	
5. They don't communicate interesting thoughts very well or clearly.	
6. They don't apply what they've learned in one situation to other appropriate situations.	
7. They don't think about the consequences of their actions.	
8. They don't listen.	
9. They are in too much of a rush to finish. They don't check their work and are overeager to get to the answer.	
10. They think their way of thinking is the only way.	

Designing a Personal Portfolio

Introduction: If we think of assessment as a "portrait" of a child, then we should create a picture that is as rich and multidimensional as possible. Imagine that you are trying to understand the abilities and strengths of two children. For the first child, you are given every report card they ever received from the first grade through high school. For the second child, you receive a large box that contains a variety of artifacts collected by the child's mother. In addition to all of the report cards are drawings and other artwork from kindergarten through high school, awards from sporting events, certificates from music classes, lots of photos, samples of writing – compositions, poems, and term papers – the child's scrapbook, and a journal kept by the mother with her impressions of her child at every birthday.

The portrait for the second child is far richer and more meaningful than the first. This activity engages participants in what they would put into the "box" if they were creating their own portfolio.

Purpose: To assist participants in understanding the importance of portfolios, to expand their concept of what a portfolio can include, and to reconnect them with the learner inside themselves.

Materials: Newsprint, easels, markers, masking tape, blank paper, and pens or pencils.

Leader's Notes: This activity helps people look at themselves as learners and encourages them to think about their own growth and development both personally and professionally. By thinking about what they would like to collect to document their growth, participants begin to imagine what their portfolios might look like. This activity has been used effectively with groups of parents, teachers, and mixed groups of educators (across grade levels and roles).

The activity also elicits insights about the usefulness of portfolios for students. For example, after a high school principal listened to teachers talk about what they would put into their portfolios, he realized how important it is for students to self-select pieces for their portfolios.

Generally, people enjoy sharing their choices and rationales. In Step 5, be sure to spend at least half of the time explicitly outlining the connections to students and their use of portfolios.

Here are some sample "pieces of evidence" that teachers have selected to put into their portfolios:

- design of a new multiage program written with a colleague
- evaluations from peers

Source: Adapted with permission of Cheri Roberts, Sunapee Elementary Central School, Sunapee, NH, 1992.

- thank-you notes from students and parents
- excerpts from reflective journals about teaching
- list of books read
- list of beliefs changed over the years
- a photo of my daughter – I've learned a lot from her
- unsuccessful thematic units with notes on how I might change them
- schedules from my classroom and how those schedules have changed over time
- old and recent essay questions, showing my development in asking questions
- progress report on a student who improved significantly

Process/Steps:

1. Ask participants to think about their own development as a teacher/administrator/parent over the last year. What stands out as excellent work, and in what ways have they grown significantly?

2. Have them make a list of no more than ten items that serve as evidence of growth. Have them imagine these items in a portfolio. Would they as a collection portray a picture of growth over a period of time? Have them include reasons why they chose these items.

3. Have participants form pairs and take turns sharing a few items with a partner, explaining how they represent growth.

4. Have a whole-group discussion with some sharing of items from people, along with their rationales. Record on newsprint.

5. Then, lead a discussion about how this activity connects to students and their use of portfolios.

Time Required: 1 hour

Appendix B

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Matching Assessment to Learning

A sampling matrix is an instrument to help you plan and record the assessing process. It serves to correlate the actual learning process with the methods used to gather evidence from it. Along one side, you might put the types of evidence you want to collect, that is, observations, interviews, artifacts, etc. Along the other side, place the categories of learning processes and contents that you want to gather evidence about. While thinking about how your curriculum is going, try to predict when might be the best times to gather information for each of the cells, or boxes, in your matrix. Don't get frustrated if at first your predictions don't work very often. Keep at it; fill in information as it comes to you, even if you can't always predict in advance. Use the matrix to keep a record of what you have collected and when you collected it. Keep the data on the child you are collecting evidence about in a file. Look through what you have collected regularly to see patterns and develop questions that further data collection might help answer. Make it a point to show the child this matrix and file and ask him or her to go through it with you from time to time.

		Learning Processes, Skills, etc.			
		Goal Setting and Self-Assessment	Working Well with Others	Independent Writing	Mathematics Concepts
Methods of Gathering Evidence	Observations		Maria 10/4 Greg 10/10 Esteban 10/23 Tanya 11/4		
	Interviews	Sam 12/2 Jared 12/10 Victoria 12/11 Flora 12/19			
	Artifacts (Student Work)			Seth 10/15 Lori 11/9 Mary 12/9 Manuel 12/10	
	Performances				John 1/15 Emily 2/20 Alexandra 1/20 Jose 2/5

Observation

Following is a discussion of some ideas to keep in mind as you explore observation as an assessment method:

- observing without interpretation or judgment;
- observing in both targeted and open-ended ways; and
- observing for short- and long-term goals.

Observing without interpretation or judgment.

As an assessment method, good observation means describing what is seen, without interpretation or judgment. The teacher may then use the observations for evaluation, yet their separation in time and deed leads to clearer judgments and thus more sound decisions.

Here is an observation a teacher might record: "Billy went to the reading corner and, after rapidly picking up and thumbing through five books, he chose one, sat down, looked at it for a couple of minutes, talked to Maria sitting next to him, went back to his book for a couple more minutes, then stomped back to the reading corner to look for another book." Here are teacher notes with interpretations and judgments: "Billy was impatient, frustrated, and unfocused today because he couldn't find a book to suit him." The teacher's interpretations may be accurate, but more data are needed to confirm them.

An observer can add interpretations to observation notes, but they should be separate, identified in some other way that will keep them distinct. Interpretations might then be used to develop hypotheses to be checked out by interviewing the student. For example, the teacher could ask Billy what he had looked for in a book, what he had found, and how he had experienced his reading time.

Observing in both targeted and open-ended ways.

A good cumulative observation record includes a mix of observations that are targeted at specific skills, knowledge, behaviors, and attitudes, and observations that are open-ended. The argument for targeted observation is clear – its purpose is to identify the progress students are making on the specific outcomes agreed upon by the community.

The reason for some open-ended observation is to allow the observer to discover the unanticipated. If teachers always observe with a predetermined frame for what they are seeking, it is possible to miss important aspects of a student's learning, even when they occur before the observer's very eyes. Being open to unintended outcomes has a precedent in scientific discoveries: Some of the most important ones were the result of scientists recognizing, rather than dismissing or overlooking, something they did not expect to see.

Observing for short- and long-term goals.

Observation is useful in assessing students at every step in their learning – where they are today, how their understanding evolves over time, where they are in relation to mid-course benchmarks over long periods of time, and how they are mastering long-term outcomes.

A good cumulative observation record portrays a student's evolving learning and includes information about significant events in that learning, regular patterns that indicate how the student approaches learning or a particular type of task, and persistent difficulties. It can be particularly helpful to record this information on a form that is developed collaboratively by teachers in the context of the curriculum. This provides more consistency across grades and subject areas.

Primary Checklist for Mathematics Operations

1. Addition using two-digit numbers	Mathematician: (student) Comments:	3. Problem solving orally
2. Subtraction using two-digit numbers		4. Problem solving in written form

Source: Adapted with permission of the Multiage Team, Sunapee (NH) Central Elementary School.

Primary Checklist for Writing Skills

Stage 3:	Labels pictures with words or phrases	Tries to make sound/ symbol correspon- dences	Uses beginning and ending sounds
Demonstrates appropriate spacing	Writer: (student)		Uses direction pattern (either top to bottom or left to right)
Begins to use punctuation	Comments:		Can sequence and order ideas
Writes a sequence piece using sentences	Topics:		Is able to read back own writing
Begins to use vowels: short, long	Able to represent 2-3 syllable words using invented spelling	Can print most lowercase letters	Stage 4:

Source: Adapted with permission of the Multiage Team, Sunapee (NH) Central Elementary School.

Rubrics for Students

Complex Thinking Standards

Student circles one statement from selections 1-4 that best describes how he or she assesses their work.

I use a variety of complex reasoning processes well.

REASONING STRATEGY 1: COMPARISON

I select useful and important items to compare.

4 I select items that are useful and important and help me make interesting comparisons; I select items that might be different from what other people select because I want to see things in new ways as a result of doing this comparison.

3 I select items that are useful and important and help me achieve the goal for the comparison.

2 I select items that will allow me to do a comparison, but the items may not be very useful or important and may even cause some problems as I do the comparison.

1 I select items that are not useful or important or that do not work for the comparison.

I select useful and important characteristics on which to compare the selected items.

4 I select characteristics that focus on the most useful and important information about the items being compared. The characteristics will help me see the items in new and unusual ways.

3 I select characteristics that are useful and important and will help me think about items in interesting ways.

2 I select some characteristics that will help me do some comparing of items, but a few of the characteristics are not very useful in the comparison.

1 I select unimportant characteristics that are not at all useful in the comparison; or I select items that I cannot even compare.

Source: Adapted with permission of McREL Institute from *Assessing Student Outcomes: Performance Assessment Using the Dimensions of the Learning Model* by Robert J. Marzano, Debra Pickering, and Jay McTighe. ©1993, 106-107.

I accurately describe how the items are the same and different for each characteristic.

4 I accurately describe the important ways the items are the same and different for each of the characteristics; I also explain interesting ideas and conclusions that occur to me as a result of the comparison.

3 I accurately describe important ways the items are the same and different for each of the characteristics.

2 I make some errors when I describe how the items are the same and different for each of the characteristics.

1 I make many significant errors when I try to describe how the items are the same and different for each of the characteristics.

Appendix C

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For further information about any of the programs in this appendix, contact names and addresses are listed in each section.

Learner-Centered Psychological Principles: Guidelines for School Redesign and Reform

Preamble: *American education is broadly viewed as a system in crisis. To overcome this crisis, the nation's President has set forth ambitious goals for education, and many efforts are underway to redesign and reform our education system. The American Psychological Association is committed to contributing to these efforts in a unique and critically important way. We want to focus attention on learner-centered principles that can provide the foundation for improving the quality of teaching and learning in American schools.*

The principles contained in this document, many of them already implemented in exemplary learning environment, represent both an ideal vision and an accumulation of practice that will continue to evolve with ongoing research. Our objective with this document is to provide significant information consistent with research generated by psychologists and educators in the areas of learning, motivation, and human development. Implementation of this information can contribute to reform efforts and, thereby, facilitate shared goals for educational excellence with information focusing on the individual learner.

Conversely, educational reform efforts that do not take these principles into account will surely fail.

Background: Throughout its history, psychology has provided information of vital importance for the design of schooling based on theory and research on human nature, learning, and development. Research in psychology relevant to education has never been more productive than during the past 10 years. Our understanding of thinking, memory, and cognitive and motivational processes has been tied together in new ways that can directly contribute to improvements in teaching, learning, and the whole enterprise of schooling. At the same time, educators concerned with the growing problems of school dropout, low levels of academic achievement, and other indicators of school failure are arguing for more learner-centered models of schooling. Such models attend to diverse learner characteristics and perspectives in order to accomplish desired learning outcomes within the context of current school reform efforts.

The following principles, which are consistent with more than a century of research on teaching and learning, are widely shared and implicitly recognized in many excellent programs found in today's schools. They also integrate research and practice in a variety of areas within and outside of psychology, including clinical, developmental, experimental, social, organizational, community, educational and school psychology, as well as education, sociology, anthropology, and philosophy. In addition, these principles reflect an integration of both conventional and scientific wisdom. They represent not only those systematically researched and evolving learner-centered principles that can lead to effective schooling, but also principles that can lead to positive mental health and more effective functioning of our nation's children, their teachers, and the organizational systems that serve them.

Both learner-centered psychological principles and a systems perspective for incorporating these principles are necessary components of a new design for schooling. A systems perspective particularly appropriate to this task is one that focuses on human functions at multiple levels of the educational system (learning, teaching, evaluating, managing). From this perspective, significant improvements in educational practice will occur only when the educational system is redesigned with the primary focus on the learner and learning level of the

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system. Psychologists, in collaboration with the educational community, can contribute to decisions on how best to apply sound psychological principles in the redesign of America's schools. A new and exciting vision of schooling, and psychology's role in this vision, can then emerge.

Our immediate goal in offering these learner-centered psychological principles is to provide guidelines that can contribute to current educational reform and school redesign efforts and thus help meet the nation's educational goals. Through collaborative dialogue with concerned groups of educators, researchers, and policymakers, these principles can be further evolved to contribute, not only to a new design for American schools, but also to a society committed to lifelong learning, healthy human development, and productivity. In developing these principles, psychology – together with other disciplines – can offer a unique contribution to the betterment of America's schools and the enhancement of the nation's vital human resources.

Learner-Centered Psychological Principles

The following twelve psychological principles pertain to the *learner* and the *learning process*. They focus on psychological factors that are primarily internal to the learner, while recognizing external environment or contextual factors that interact with these internal factors. These principles also attempt to deal holistically with learners in the context of real-world learning situations. Thus, they must be understood as an organized set of principles and not treated in isolation. The first ten principles subdivide into those referring to *metacognitive and cognitive*, *affective*, *developmental*, and *social* factors and issues. Two final principles cut across the prior principles and focus on what we know about *individual differences*. Finally, the principles are intended to apply to *all learners*, preschool-aged and beyond.

Metacognitive and Cognitive Factors

Principle 1: **The Nature of the Learning Process. Learning is a natural process that is active, volitional, and internally mediated; it is a goal-directed process of discovering and constructing meaning from information and experience, filtered through each individual's unique perceptions, thoughts, and feelings.**

Students have a natural inclination to learn and pursue personally relevant learning goals. They are capable of assuming personal responsibility for learning – monitoring, checking for understanding, and becoming active, self-directed learners – in an environment that takes past learning into account, ties new learning to personal goals, and actively engages students in their own learning process. In meaningful life situations, even very young children naturally engage in self-directed learning activities in pursuit of personal goals. During the learning process, individuals create and construct their own meanings and unique interpretations based on previously existing understandings and belief systems.

Principle 2: **The Goal of the Learning Process. The learner seeks to create meaningful and sensible representations of knowledge regardless of the quantity and quality of data available.**

Learners generate integrated, "common sense" representations and explanations for even poorly understood or poorly-communicated facts, concepts, principles, or theories. Learning processes operate holistically in the sense that internally consistent understandings emerge – understandings that may or may not be valid from an objective, externally oriented perspective. With increased knowledge of values and meanings within a discipline, however, learners can increasingly refine their conceptions as they see gaps and inconsistencies and the need to revise prior conceptions.

Principle 3: **The Construction of Knowledge. The learner organizes information in ways that associate and link new information with existing and future-oriented knowledge in uniquely meaningful ways.**

Given that backgrounds and experiences of individual learners can differ dramatically, and given that the mind works to link information meaningfully and holistically, learners will organize information in ways that are uniquely meaningful to them. In formal educational contexts it is desirable for all learners to create shared understandings and conceptions regarding fundamental knowledge and skills that define and lead to valued learning outcomes. In these situations, learning can be facilitated by assisting learners in acquiring and integrating knowledge, e.g., by teaching them strategies for constructing meaning, organizing content, accessing prior knowledge, relating new knowledge to general themes or principles, storing or practicing what they have learned, and visualizing future implications and applications of the knowledge.

Principle 4: **Higher-Order Thinking. Higher-order strategies for "thinking about thinking" – for overseeing and monitoring mental operations – facilitate creative and critical thinking and the development of expertise.**

During early to middle childhood, learners become capable of a metacognitive or executive level of thinking about their own thinking that includes self-awareness, self-inquiry or dialogue, self-monitoring, and self-regulation of the processes and contents of thoughts, knowledge structures, and memories. Learners' awareness of their personal agency or control over thinking and learning processes promotes higher levels of commitment, persistence, and involvement in learning. The facilitative aspects of self-awareness of agency are best realized in settings where learners' personal interests, values, and goals are respected and accommodated.

Affective Factors

Principle 5: **Motivational Influences on Learning. The depth and breadth of information processed, and what and how much is learned and remembered, is influenced by (a) self-awareness and beliefs about personal control, competence, and ability; (b) clarity and saliency of personal values, interests, and goals; (c) personal expectations for success or failure; (d) affect, emotion, and general states of mind; and (e) the resulting motivation to learn.**

The rich internal world of beliefs, goals, expectations, and feelings can enhance or interfere with learners' quality of thinking and information processing. The relationship between thoughts, mood, and behavior underlies individuals' psychological health and functioning as well as their learning efficacy. Learners' interpretations or cognitive constructions of reality can create barriers to positive motivation, learning, and performance. Although negative thoughts and feelings can adversely affect motivation and learning, positive learning experiences can help reverse negative thoughts and feelings and contribute to positive motivation to learn.

Principle 6: **Intrinsic Motivation to Learn. Individuals are naturally curious and enjoy learning in the absence of intense negative cognitions and emotions (e.g., insecurity, worrying about failure, being self-conscious or shy, fearing corporal punishment or verbal ridiculing or stigmatizing labels).**

Positive motivation for learning is largely dependent on helping to elicit and develop students' natural curiosity or intrinsic motivation to learn, rather than "fixing them," giving them something they lack, or driving them by fear of corporal punishment or excessive punishments of any kind. At the same time, both positive interpersonal support and instruction in personal self-control can offset factors that interfere with optimal learning – factors such as low reflective self-awareness; negative personal beliefs; lack of personal learning goals; negative expectations for success; and anxiety, insecurity, or pressure that makes learning aversive.

Principle 7: **Characteristics of Motivation – Enhancing Learning Tasks. Curiosity, creativity, and higher-order thinking processes are stimulated by relevant, authentic learning tasks of optimal difficulty, challenge, and novelty for each student.**

Positive affect, creativity, and flexible and insightful thinking are promoted in contexts which learners perceive as personally relevant and meaningful, and in which they have opportunities to make choices in line with their interests and the freedom to change the course of learning in light of self-awareness, discovery, or insights. Higher-order thinking skills and creativity are elicited when students have opportunities to work on projects that are at a level of complexity and duration that is comparable to real-world issues and problems. In addition, curiosity is enhanced when students have opportunities to work on personally relevant learning tasks of optimal difficulty, challenge, and novelty for them individually.

Developmental Factors

Principle 8: **Developmental Constraints and Opportunities. Individuals proceed through identifiable progressions of physical, intellectual, emotional, and social development that are a function of unique genetic and environmental factors.**

Children learn best when material is appropriate to their developmental level, presented in an enjoyable and interesting way, while at the same time challenging their intellectual, emotional, physical, and social development. Unique environmental factors (e.g., the quality of language interactions between adult and child and parental involvement in the child's schooling) can influence development in each area. An overemphasis on developmental readiness, however, may preclude learners from demonstrating that they are more capable intellectually than schools, teachers, or parents allow them to show. Awareness and understanding of unique developmental differences of children with special emotional, physical, or intellectual disabilities as well as special abilities can greatly facilitate efforts to create optimal learning contexts.

Personal and Social Factors

Principle 9: **Social and Cultural Diversity. Learning is facilitated by social interactions and communication with others in a variety of flexible, diverse (cross-age, culture, family background, etc.), and adaptive instructional settings.**

Learning is facilitated by diverse settings that provide the learner with an opportunity to interact with a variety of students representing different cultural and family backgrounds, interests, and values. Divergent and flexible thinking as well as social competence and moral development are encouraged in learning settings that allow for and respect diversity. In such settings, individuals have an opportunity for perspective taking and reflective thinking, thereby facilitating insights and breakthroughs to new knowledge.

Principle 10: **Social Acceptance, Self-Esteem, and Learning. Learning and self-esteem are heightened when individuals are in respectful and caring relationships with others who see their potential, genuinely appreciate their unique talents, and accept them as individuals.**

Individuals access to higher-order, healthier levels of thinking, feeling, and behaving is facilitated by quality personal relationships. Teachers' (or other significant adults') states of mind, stability, trust, and caring are preconditions for establishing a sense of belonging, self-respect, self-acceptance, and positive climate for learning. Healthier levels of thinking are those that are less self-conscious, insecure, irrational, and/or self-deprecating. Self-esteem and learning are mutually reinforcing.

Individual Differences

Principle 11: **Individual Differences in Learning. Although basic principles of learning, motivation, and effective instruction apply to all learners (regardless of ethnicity, race, gender, presence or absence of physical handicaps, religion, or socioeconomic status), learners differ in their**

preferences for learning mode and strategies, and unique capabilities in particular areas. These differences are a function of both environment (what is learned and communicated in different cultures or other social groups) and heredity (what occurs naturally as a function of genes and resulting differential capacities).

The same basic principles of learning, motivation, and effective instruction apply to all learners. At the same time, however, learners are born with and develop unique capabilities and talents, and have acquired through learning and social acculturation different preferences for how they like to learn and the pace at which they learn. In addition, it must be recognized that learning outcomes are an interactional and interdependent function of student differences and curricular and environmental conditions. Understanding and valuing cultural differences and the cultural contexts in which learners develop enhances the possibilities for designing and implementing learning environments that are optimal for all, not just some, students.

Principle 12: **Cognitive "Filters." Personal thoughts, beliefs, and understandings resulting from prior learning and unique interpretations become each individual's basis for constructing reality and interpreting life experiences.**

Unique cognitive constructions form a basis for beliefs about and attitudes toward others. Individuals then operate out of these "separate realities" as if they were true for everyone, often leading to misunderstandings and conflict. Awareness and understanding of these phenomena allows greater choice in what one believes, more control over the degree to which one's beliefs influence one's actions, and an ability to see and take into account others' points of view. The cognitive, emotional, and social development of a child and the way that child interprets life experiences is a product of prior schooling, home, culture, and community factors.

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GEOGRAPHY Anthony de Souza National Council for Geographic Education 1145 17th Street, NW Washington, DC 20036-4688 (202) 775-7832	**SOCIAL STUDIES** Martha Lassey Rose, Executive Director National Task Force for Social Studies Standards National Council for the Social Studies 3501 Newark Street, NW Washington, DC 20016-3167 (202) 966-7840, Ext. 116
HISTORY Charlotte Crabtree, Director National Center for History in the Schools 10880 Wilshire Blvd., #761 Los Angeles, CA 90024 (310) 825-4702	**VOCATIONAL EDUCATION** U.S. Department of Education Office of Vocational and Adult Education 330 "C" Street, NW Washington, DC 20202 (202) 260-9576

For a free copy of "Status Report on Voluntary National Standards in Education," contact Jean Guyer at The Regional Laboratory for Educational Improvement of the Northeast and Islands, 300 Brickstone Square, Suite 950, Andover, MA 01810 • (508) 470-0098.

Title I of the Goals 2000: Educate America Act Establishes the National Education Goals

Goal 1 – School Readiness
By the year 2000, all children in America will start school ready to learn.

Goal 2 – School Completion
By the year 2000, the high school graduation rate will increase to at least 90 percent.

Goal 3 – Student Achievement and Citizenship
By the year 2000, all students will leave grades 4, 8, and 12 having demonstrated competency over challenging subject matter, including English, mathematics, science, foreign languages, civics and government, economics, arts, history, and geography. Also, every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our nation's modern economy.

Goal 4 – Teacher Education and Professional Development
By the year 2000, the nation's teaching force will have access to programs for the continued improvement of their professional skills and the opportunity to acquire the knowledge and skills needed to instruct and prepare all American students for the next century.

Goal 5 – Mathematics and Science
By the year 2000, United States students will be first in the world in mathematics and science achievement.

Goal 6 – Adult Literacy and Lifelong Learning
By the year 2000, every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.

Goal 7 – Safe, Disciplined, and Alcohol- and Drug-Free Schools
By the year 2000, every school in the United States will be free of drugs, violence, and the unauthorized presence of firearms and alcohol and will offer a disciplined environment conducive to learning.

Goal 8 – Parental Participation
By the year 2000, every school will promote partnerships that will increase parental involvement and participation in promoting the social, emotional, and academic growth of children.

For further information, contact the Goals 2000 Office, U.S. Department of Education, 400 Maryland Avenue, SW, Room 4141, Washington, DC 20202 (202) 401-0039.

Goals 2000: Educate America Act

On March 31, President Clinton signed into law the Goals 2000: Educate America Act. In doing so, he reaffirmed the original six National Education Goals in Title I of the Act – school readiness, school completion, student academic achievement, national leadership in math and science, adult literacy, safe and drug-free schools – and added two new goals for increasing parental participation and professional development of teachers.

The primary aim of the Goals 2000: Educate America Act is contained in Titles II and III, which is to reinvent American schools by: 1) creating a framework for establishing high academic and skill standards; and 2) by providing the leadership and support states and communities need to help students reach those standards. States and local communities that participate in Goals 2000 can use its framework to build upon and guide their current systemic reform efforts.

The Goals 2000: Educate America Act:

- supports the development of challenging academic standards that define what students should know and be able to do, and offers states and local communities the support they need to put those higher standards to work in their classrooms;
- encourages the development of new student performance assessments and other new methods of gauging student achievement that will be linked to national, state, and local standards and which will be valid, reliable, and free of discrimination;
- supports the development of voluntary opportunity-to-learn standards and strategies for ensuring that all students are provided the opportunity to meet high academic standards;
- supports the creation of voluntary national occupational standards that, with the help of business and labor, will define the knowledge and skills needed for the complex, high-wage jobs of tomorrow;
- supports a "bottom-up," grass-roots approach to school reform, with the federal government supporting states and local communities in the development and implementation of their own comprehensive and innovative reform programs; and
- supports the establishment of parent information and resource centers, in order to help provide parents with the knowledge and skills needed to effectively participate in their child's education.

Each participating state and community will develop and implement a comprehensive improvement plan that raises academic standards and helps students achieve them. A broad-based leadership team composed of policymakers, educators, business and civic leaders, parents, and others will help create each state's improvement plan. States may adopt national content and performance standards or they may develop their own.

In addition to development of standards and assessments, state improvement plans must address:

- parent and community support and involvement;
- dropout-prevention strategies;

Source: Adapted from *Goals 2000: A World-Class Education for Every Child*, U.S. Department of Education, Goals 2000 Office, 1994.

- governance, accountability, and management strategies;
- school-to-work transition;
- coordination with health and other child service agencies;
- use of technology to enhance teaching and learning; and
- strategies for reporting progress to the public.

Most of each state's funding will support school districts for developing and implementing their own comprehensive plans, as well as training and professional development for teachers and principals. The Act requires that states allocate 60 percent of their Goals 2000 funds in 1994 and 90 percent in each subsequent year to districts. And most of each school district's funding – 75 percent in 1994 and 85 percent in each year thereafter – must go to individual schools for carrying out their own Goals 2000 plans.

Congress appropriated $105 million for Goals 2000 in 1994. State allotments are calculated by a needs-based formula, with allotments ranging from $372,000 to $9,764,000 for fiscal year 1994. President Clinton has asked Congress for $700 million for fiscal year 1995.

The New Standards Project

New Standards is a response to:

- **students** who want us to tell them clearly not how long they have to stay in school to get a diploma but what they really need to know to succeed in life;
- **parents** who want high standards and to know whether their children are meeting those standards;
- **educators** frustrated by multiple-choice tests that fail to measure what really matters, who want assessments of the thinking and problem solving skills that modern life demands;
- **the business community**, which understands the importance of clear standards and good measures of performance; and
- **policymakers** who need better ways to gauge whether the dollars invested in education are producing the results the public wants.

The New Standards Project is adopting a set of very high national education standards and developing a new kind of assessment system designed to gauge student progress towards those standards. New Standards is a grassroots partnership of states and school districts that collectively enroll more than half of the school children in the United States. Thousands of classroom teachers are playing an important role in building practical new assessments, with help from the world's leading experts in assessment, learning, and curriculum. The system we are building will accommodate locally developed assessments that will be linked to a common national standard. It will provide great flexibility for states, districts, and even schools to set their own curricula within a common system of student performance standards. Our purpose is not simply to produce better measures of student achievement. The states and districts that are leading the nation in the redesign of American education have named the lack of shared standards for student achievement and good methods for assessment as the single greatest obstacle to creating high performing schools. The President, the governors, many business leaders, and others share this view. The primary goal of New Standards is to use a new system of standards and assessments as the cornerstone of a strategy to greatly improve the performance of all students, particularly those who perform least well now.

Who We Are

New Standards is a joint program of two organizations: The National Center on Education and the Economy and the Learning Research and Development Center at the University of Pittsburgh.

New Standards has attracted partners – states and local school districts – who already were far along in designing and administering a new generation of assessments based on performance rather than multiple-choice tests.

New Standard's governing board includes governors, chief state school officers, teachers, business executives, school board members, child advocates, civil rights officials, union heads, and others. The co-directors of the Project are Lauren B. Resnick, director of the Learning Research and Development Center at the University of Pittsburgh, and Marc S. Tucker, president of the National Center of Education and the Economy.

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The New Standards System

The system created by the New Standards Project will set a very high American standard of performance for all students, a standard as high as any in the world. These assessments will emphasize the ability to think well, demonstrate a real understanding of subjects studied, and apply what one knows to the kind of complex problems encountered in life. The New Standards system will employ advanced forms of performance assessment, including portfolios, exhibitions, projects, and timed performance examinations, all based on the use of real-life tasks that students are asked to do alone and in groups. Some of these tasks can be completed in minutes, but others will take weeks or even months.

In establishing content standards for its work, New Standards is drawing on the work of national bodies such as the National Council of Teachers of Mathematics and on curriculum frameworks developed by the states. It will also work to establish international benchmark standards for student performance. Many of the tasks that will constitute the core of the examinations already have been produced. The first valid, reliable, and fair exams will be available for use in math and in English language arts by 1994-95; in applied learning by 1995-96; and in science by 1996-97. Other discipline areas will follow. We are working to establish exam comparability to enable New Standards to decide whether different exams are in fact examining to the same standard.

New Standards will not be a sorting system. The strategy of establishing a very high standard for all students is intended to strike at the heart of the most inequitable feature of the American education system: the consistent tendency to underestimate the capacity of low-income and minority students and the practice of holding them to a lower standard of accomplishment.

The standards to which our partners agree will be applied to all students. What we expect to vary, instead, is the time that it will take to reach the standards. We know, too, that some students will require more resources and support than others to meet the standards. New Standards is working to ensure that the standards we develop and the way in which we work reflect the rich diversity in perspectives that is the special asset of this country.

How We Are Building the System

Classroom teachers – the people closest to students – are deeply involved in building the performance tasks that constitute the essence of the new system. That process began in the summer of 1991 in Snowmass, Colorado, when more than 400 teachers from around the nation came together with the top experts in assessment, learning, and curriculum to create the first of these tasks. Those tasks were refined over the winter and more were created. In the spring of 1992, nearly 10,000 fourth graders in 18 states participated in pilot examinations in mathematics and writing and reading. The student responses were then scored at a national meeting of 150 teachers and experts at the end of June 1992. Six weeks later, this scoring was reviewed and new tasks were developed at a conference of nearly 600 teachers and experts from around the country in Phoenix, Arizona. This process is being repeated for each New Standards subject matter area at each grade level and is being extended to the point at which large bodies of tasks and scoring guides are assembled into exams that have been fully tested in the field.

An expanded pilot was administered in the spring of 1993 to approximately 37,000 children. Scoring guides were developed by teachers and content specialists to make sure the grading could be consistent and the standards very high. These student responses were then `scored' at a national conference in Snowbird, Utah, by several hundred teachers and by thousands more at regional and local scoring conferences. The results showed that regular classroom teachers, with training, could consistently grade this open-ended work.

In 1993, New Standards brought together teams of teachers and other experts from around the country to design a system of portfolios of student work that similarly can measure a very high standard and be graded consistently. The first of these portfolios are expected to be in use by students in 1994-95.

New Standards has begun an international benchmarking process of looking at other industrialized countries to systematically examine their standards and the quality of student work.

As the tasks are being created, our effort to determine performance standards in other countries will go forward, and we will mount an extensive campaign to engage the public in the United States in thinking through what level of student performance is good enough for this country. In 1993, the Project worked with the Public Agenda Foundation to listen to the concerns of Americans, and produced a handbook to help communicate with them about the issues of standards, testing, and reform. The results of the international benchmarking work, the public engagement effort, and the views of subject matter experts and teachers will all be taken into account in setting the student performance standards.

What We Believe

If we are truly interested in ensuring that all students meet very high standards, then we have to be concerned with far more than the standards and measuring how students are doing.

The New Standards partners believe that all students must have a fair shot at reaching the new performance standards. At a minimum, they must be taught a curriculum that will prepare them for the assessments, they must have teachers who are able to teach that curriculum well, and there must be an equitable distribution of the resources that students and teachers need to succeed.

Our purpose is not simply to measure student performance but to improve it radically. If New Standards is to be an instrument for comprehensive and systemic reform of American education, then it must conduct its work according to the principles that follow.

New Standards Project Principles

1. It is possible to have an education system that is both equitable and excellent. Our system of standards and assessments can and should reflect that commitment. Its goal will be to raise the achievement of all students, not simply to measure student performance. This will mean raising the top as well as closing the gap between the best and the worst student performances.

2. It is time to abolish the practice of expecting less from poor and minority children and children whose native language is not English. Student performance standards and assessment systems will be designed to help bring all groups of students to high levels of performance.

3. Our standards of performance will be among the highest in the world and the same for all New Standards partners, though states and districts may use different curricula and different assessments to measure student performance. We are one country, not many, and no child should be denied the right to a first-class education simply because he or she goes to school in a certain state rather than another or in one school district.

4. The education standards we set will emphasize thinking and students' capacities to use what they know outside a school setting. The assessments will use performance examinations, projects, exhibitions, and portfolios to assess students' capacities to apply what has been learned to the complex problems that they will encounter as citizens, family members, and members of the workforce.

5. Though the standards will be uniform, schools will be free to use very different methods to help students achieve the new standards, and our assessments will provide students with many ways to demonstrate their competence, enabling them to take advantage of the strengths of their particular backgrounds and experiences. We will work to keep our assessments free of any cultural, gender, or racial bias and make them accessible to students whose native language is not English. Our assessments will meet the highest standards of technical quality.

6. Standards will be set through a public process that engages all sectors of society nationwide. Education standards are not the concern of educators alone. Parents especially, but also employers, child advocates, and the public at large have a stake in what the students learn. Standards and assessments must be continually renewed to reflect what we learn about the effects of the new system and the changing needs of the society.

7. Our assessments will be deliberately designed as targets for instruction and learning. Development and implementation of new assessments will be linked to state and local programs of professional development and to curriculum resources based on the same standards for what students should know and be able to do. We do not intend for our new assessments to add to the testing burden on schools and will work to reduce that burden as much as possible.

8. Teachers, as well as the content specialists who work directly with them, will be actively involved in developing, grading, and interpreting the assessments. Only in this way will those who must implement the system become fully committed to it.

9. Students, parents, and teachers must be convinced that competence, as demonstrated on the assessments, will lead to real opportunity for further education and jobs with advancement prospects. We will work with colleges and employers to provide positive incentives for students to work hard in school to meet the new standards.

The Social Compact

10. Since, for students, much will depend on meeting high standards of performance, we pledge to uphold our part of a new social compact. Specifically, we pledge to do everything in our power to ensure all students a fair shot at reaching the new performance standards, and to prevent students' performance on the new assessments from being used as the basis for awarding a diploma or any other form of credential unless all students in the jurisdiction awarding the credential have had an opportunity to prepare themselves well. This means that they will be taught a curriculum that will prepare them for the assessments, their teachers will have the preparation to enable them to teach it well, and there will be an equitable distribution of the resources the students and their teachers need to succeed.

    We believe that educators should be held accountable for the progress that students make against the new standards if the minimum requirements of fairness we just spelled out are met. But educators alone cannot do the job of bringing all of our children up to an international standard of educational excellence. We call on families to do their part and on the larger society to provide support to families, high-quality early childhood programs, health care, and other resources to make it possible for all our children to succeed in school.

For further information, contact the New Standards Project, National Center on Education and the Economy, 700 Eleventh Street, NW, Suite 750, Washington, DC 20001 • (202) 783-3668.

The world that young people are being prepared to live and work in is constantly changing. The ways we educate and assess students also needs to change. *Genuine Reward: Community Inquiry into Connecting Learning, Teaching, and Assessing* helps communities look carefully at what they want their young people to know and be able to do in the context of current and future demands in global society.

This resource suggests a process for designing schools in which learning, teaching, and assessing are strongly interconnected. Based on work that The Regional Laboratory for Educational Improvement of the Northeast and Islands is doing with schools and communities in the Northeast, Puerto Rico, and the Virgin Islands, it recommends that communities form widely representative, cross role, design teams who work to focus their schools on learning. The guide is based on the premise that what we know about learners and learning must drive good teaching and assessing. It provides a conceptual framework for how the three domains of learning, teaching, and assessing are connected. This framework is described with real life examples, syntheses of current research, and activities communities can use as they engage in the work of designing their schools for learning.

One of ten regional educational laboratories in the United States, The Regional Laboratory for Educational Improvement of the Northeast and Islands serves New England, New York, Puerto Rico, and the Virgin Islands and is sponsored primarily by the United States Department of Education's Office of Educational Research and Improvement. The Laboratory has been serving the educators and policymakers of the Northeast and Islands since 1985. For information about the Laboratory call or write:

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